

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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LONDON. SATURDAY, NOVEMBER 3. 1877.

MR. JAMES H. CROFTS, STOCK AND SHARE BROKER,  
AND MINING SHARE DEALER,  
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.  
ESTABLISHED 1842.

BUSINESSES transacted in all descriptions of MINING Stocks and Shares (British and Foreign), Consols, Banks, Bonds (Foreign and Colonial), Railways, Miscellaneous, Insurance, Assurance, Telegraph, Shipping, Canal, Gas, Water, and Dock Shares.

BUSINESSES negotiated in Stocks and Shares not having a general market value.

BUSINESSES in COLLIERY and IRON Shares, and in the principal WAGON and MANUFACTURING COMPANIES of the NORTH of ENGLAND and SCOTLAND.

BUSINESSES in all the principal COTTON SPINNING Shares.

BUSINESSES TRANSACTED in all MISCELLANEOUS SHARES (of whatever description) having LONDON or COUNTRY MARKET VALUES.

Mr. J. H. CROFTS, having now established CORRESPONDING AGENCIES in all the chief TOWNS of the United Kingdom, is prepared to deal in the various local Stocks and Shares at close market prices.

ACCOUNTS OPENED FOR THE FORTNIGHTLY SETTLEMENT.

A Daily Price List, issued at 5 P.M., giving latest Quotations up to close of business, also on the 1st of every month a List of all Securities currently dealt in, upon the Mining and Stock Exchanges, with latest prices, current dividends, and amount of interest yielded at market price, &c., and every Friday a general List containing closing prices of the week.

MINES INSPECTED.

BANKERS: CITY BANK, LONDON; SOUTH CORNWALL BANK, ST. AUSTELL.

SECTIAL DEALINGS in the following, or part:—

10 Great Laxey, £21 7 6d. 100 Parys Moun., 10s. 6d.

50 Holmbush, 30s. 50 Port Phillip, 1s.

20 Hultafall, 22s. 3d.

50 Javall, 7s. 6d. 20 Richmond, £7 2s. 3d.

30 Lawes Chemical, £7 1/2 15 Roman Grav., £8.

20 Leadhills, £5 2s. 6d. 25 St. Harmon, £2 1/2.

25 Llanrwst, £2 15s. 20 S. Condurrow, £9 7 6.

20 Ladywell, 21s. 3d. 10 Tankerville, £5 1s. 3d.

20 Llan G., 23s. 50 Van Consols, 10s.

25 Marke Valley, 14s. 6d. 20 W. Tankerville, £7s. 6d.

10 Minera, £18. 10 West Chiverton, £21 4 1/2.

15 N. Quebrada, £2. 100 W. Commbartin, £7 6d.

25 North Laxey, 13s. 15 Wheat Newton.

20 Pateley Bridge, £2 1 3 50 Yorks Peninsula, 5s.

50 Pestatea, 5s. 10 Wye Valley, £2 1/2.

10 Wye Valley, £2 1/2.

MINES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.

BUSINESSES also on hand in—East Craven Moor, Lisburne, Last Chance, and Llanrwst, Pendragon, Pennant, Pandora, Plymimon, Santa Barbara, West Wye Valley.

100 Positive Assurance, 5 Copiapo, 200 Port Nigel, and 5 West Prussia Mining.

TIN SHARES, AND THE RISE IN TIN.—SPECIAL BUSINESS at close prices in Carn Brea, Cook's Kitchen, Dolcoath, East and South Condurrow, Tincroft, Wheal Agar, Peverar, Grenville, Uny, and James H. CROFTS, 1, FINCH LANE, LONDON.

FOREIGN BONDS—ARGENTINE—EGYPTIAN—RUSSIAN, TURKISH, SPANISH, PERU, &c.

SPECIAL BUSINESS in the above, and Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

RAILWAYS—HOME AND FOREIGN.—SPECIAL BUSINESS in the above, and Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

COTTON SPINNING SHARES.—BUSINESS in all OLDHAM SHARES, and in those of other DISTRICTS.

\*SPECIAL BUSINESS in the following SELECTED SHARES:—

100 Gossamer, Green Lane, Oldham Twist, Royton, Shaw, Star, and 100, at close market prices.

100—The shares of good Cotton Spinning Companies pay remunerative dividends, the mills being almost entirely conducted on the Co-operative System, under the Limited Liability Acts. With a revival in trade the present rate of dividends would be augmented.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

BANKERS: City Bank, London; South Cornwall Bank, St. Austell.

ESTABLISHED 1842.

MR. W. H. BUMPUS, STOCK AND SHARE BROKER,

AND MINING SHARE DEALER,

44, THREADNEEDLE STREET, LONDON, E.C.

ESTABLISHED 1867.

BUSINESSES transacted in MINING and COLLIERY Shares of every description.

British and Foreign Stocks, Colonial Government Bonds, Railways, Banks, and Miscellaneous Shares, and all Securities dealt in on the London Stock Exchange, for INVESTMENT or SPECULATION.

Purchases and Sales negotiated in Unmarketable Stocks and Shares.

Speculative Accounts opened for the Fortnightly Settlement.

References given and required when necessary.

A Stock and Share List forwarded free on application.

Mr. BUMPUS has SPECIAL BUSINESSES in the undermentioned:—

25 Flagstaff, £3 18s. 50 Rookhope, 21s. 6d.

100 Argentine, £2 1/2. 50 Gienroy, 18s. 10 Roman Grav., £7 1/2.

100 Bumpus, 22s. 20 Gorseid & Mer., £8. 15 Hildon.

100 Cambrian, 22s. 25 Hultafall.

100 Chonales, 22s. 50 Leadhills, £5.

100 Pedro, 6s. 6d. 25 Javall, 8s.

100 Dev. Consols, 19s. 6d. 25 Leadhills, £5 1/2.

100 Last Cradon, 19s. 6d. 10 Llanidloes.

100 Llanegwad, 7s. 6d. 50 Marke Valley, 18s.

100 Last Van, 23s. 20 North Laxey.

100 Leadhills, 12s. 30 West Ashton, 14s.

100 Pateley, 22s. 25 West Godolfin.

100 Pateley Bridge, 22s. 25 Penstruthal, 7s.

100 Pateley Bridge, 22s. 15 Wheal Kitty.

100 Pateley Bridge, 22s. 20 Pateley Bridge, 21s.

## Lectures on Practical Mining in Germany.

## CLAUSTHAL MINING SCHOOL NOTES—No. XLIX.\*

BY J. CLARK JEFFERSON, A.R.S.M., W.H. SC.,

Certified Mining Engineer.

(Formerly Student at the Royal Bergakademie, Clausthal).

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## SECTION III.

When the holes are charged with the use of the copper needle the top of the cartridge is closed, and the cartridge is pushed to the bottom of the bore hole with a wooden stick or copper stemmer, and the needle is then pushed down the hole, and carefully pricked through and well into the cartridge, after which the tamping is inserted, and rammed down lightly at first, but afterwards more tightly till the hole is filled to the end. In order to prevent the needle becoming so tightly fastened in by the tamping that it can only with difficulty be removed, it is usual during tamping occasionally to turn the needle round by means of the ring at the end, so that when the tamping is completed, and it is desired to withdraw the needle, all that is necessary is to pass the stemmer through the eye or ring of the needle, and to give it several light blows in a backward direction. The hole left by the needle is filled with fine powder, or straws or the like containing powder are inserted; a quick match, or touch string, often a piece of string soaked in sulphur, is attached to the end. This is generally done by melting the sulphur at one end of the band in the flame of the pit lamp, and before the sulphur is cool to stick it to the end of the straws, &c. Before attaching the sulphur band to the straws, &c., the band is drawn once or twice rapidly through the flame of the lamp, so as to singe off any fine threads which might otherwise when the light was applied to the end of the sulphur band catch fire, and carry the ignition to the powder sooner than was intended.

When a safety-fuse is used, one end of the cartridge is opened, and the end of the fuse inserted about 2 in. into the powder; the end of the cartridge is then closed, and tied round and to the fuse, to prevent the latter from slipping, or being drawn or driven out during tamping. The cartridge, with the fuse so attached, is then pushed gently down into the hole, the fuse being allowed to slip through the hand; care, however, must be taken during this and the subsequent tamping not to withdraw the fuse out of the cartridge, and so cause a miss-fire. The tamping is then rammed down, as before.

A safety-fuse has the advantage that it can be used in wet or in dry holes, the tamping can be made much tighter, there is no loss of powder owing to part of it being blown through the bore hole, and the resulting gases find no vent, as is the case when the needle is used, and besides the length of time to elapse between lighting the fuse and the ignition of the powder can be better proportioned, so that several shots can be lit at once, though of course the resulting explosions are not simultaneous, as is the case when firing by electricity is resorted to; the saving of time, however, to which we have above referred in the withdrawal of the workmen once for several shots instead of each time a shot is fired is effected. The ordinary safety-fuse burns at the rate of between 2 ft. and 3 ft. per minute. Before a fuse is lit all the miners in the neighbourhood should withdraw to a place of safety, and corf, &c., should be also taken out of reach of the effects of the shot. The miner who lights the fuse retires immediately after doing so, calls "fire," and waits in some sheltered place the result. To prevent any person inadvertently (as might easily happen in coal mines) from approaching, one workman should retire along each separate road leading to the place, so that all persons approaching would be properly warned. If the charge has missed fire the place should not be approached till some time after. In this country it is the duty of the shot lighter to pull up a pair of rails and place them across the entrance to the place, and no person is allowed to enter the place till four hours afterwards. On the Continent it is allowed to scrape out the tamping, and insert a fresh fuse, or train, in the hole; in this country such a proceeding is forbidden. If the charge explodes, after allowing time for the smoke to clear away, the miner returns to his place, and picks or sorts out some of the smaller portions of ore by hand; the large blocks of ore or coal are broken by hammer, wedge, or pick, and filled for sending out to the surface.

**FIRE SETTING.**—This method of winning masses of ore, &c., by means of fire, though now but seldom used (chiefly in the Hartz, Ramelsberg, in Hungary, Saxony, the Erzgebirge, &c.), is of great antiquity, and appears to have been known to the Egyptians. Pliny mentions it as being used during the passage of Hannibal over the Alps. Since the invention of gunpowder this method has become less and less used, and with the discovery of such blasting materials as dynamite and gun-cotton its expensiveness, and the inconvenience and danger attending its use, may be expected to lead to its abandonment except in very special cases. The inconveniences attending this method arise from the noxious influence of the gases resulting from the combustion, the smoke of which, besides the annoyance it causes the workmen, blackens the whole face of the lode; the great heat to which the workmen are exposed, and which causes some of the rocks to splinter, and occasions the loss of some of the ore as dust; the necessity in many cases of covering the faces of the miners with a mask, to prevent them from being hurt by the springing of small pieces of rock; the necessity of having a strong air current, not only to feed the fire, but to prevent the choking of the workmen by the gases from the combustion; the liability of the sudden breaking off of large pieces of rock, which cannot well be distinguished in the smoke; the inapplicability to some ores, which melt readily, or which, like arsenic compounds, give off poisonous gasses; and the difficulty in many places, not only of keeping up the fire properly, but of preventing it going out; and from the necessity of making special arrangements when it is intended to employ this method, or only to do it when all the miners except those engaged in the fire setting are out of the pit. It is usually effected late in the afternoon or night, or on Saturday and Sunday.

Fire setting is usually only attempted in massive deposits, where the rock is extremely compact and dry, though there should be a few cracks to allow of the expansion of the rock, and where wood is cheap. In carrying out the operation of fire setting, although not generally, still in many places, an iron frame or case, called the "Prägelkatz." This consists of a four sided frame, two sides only being parallel. The frame is supported on four legs at the corners; the end next the face is 18 in. broad, and about 12 in. high, the opposite end is 30 in. broad and 18 in. high, the frame being 30 in. from end to end. It thus forms the skeleton of a truncated pyramid. The wood is laid in bundles inside the apparatus, and after being ignited the sides and top are covered with plates of sheet-iron; the burning wood is thus held better together, and the draught caused promotes the intensity of the combustion, and drives the flame out at the smaller end against the face of the rock.

For non-flaming fuel a temporary fire-place must be arranged. This is done by laying across the end of the level and near to the face two iron rails, from 2½ ft. to 3½ ft. apart, the one next the face being about 1 ft. above the floor of the level, and that furthest from the face about 18 in. above the flooring of the level. On these two rails bars of iron, at a suitable distance apart, are laid lengthways, on which the fuel is placed. Just above the rail furthest from the face a fire bridge, made of bricks piled loosely together, is placed. The draught caused by the fire enters beneath the fire-grate, which being inclined downward towards the face causes the draught to project the flames better against the face. It is essential in the use of non-flaming fuel that the draught can enter beneath the fire, which is impossible with the use of the ordinary Prägelkatz.

In order to effect a saving in labour, and to be enabled also to use non-flaming fuel, Hugon has devised a special apparatus for fire setting. This consists of a box somewhat similar in shape to a modern parlour coal-scuttle, without any lid at the front end next

the face of the rock. The upper part of the box at the back forms a short rectangular hopper provided with a lid, and through which the fuel is introduced during the operation. The apparatus is so arranged that if necessary it can be fitted with a fire-grate inside, at a height of about 1 ft. from the bottom. At the back closed end of the apparatus near the bottom is a small round opening, in which the tuyere from a fan can be inserted. A stopcock, or valve, is fitted on the tuyere, so as to shut off when desired all communication between the fan and the furnace. The furnace rests on four wheels, so that it can be readily pushed forward or withdrawn on the rails from the face of the rock. The fan is driven by means of a strap from some convenient motive power, which might simply be that of a couple of men turning a small fly-wheel. The fire is first lit with dry wood, and afterwards coal or coke is introduced. After the fire has got hold, in about 15 minutes, the furnace is pushed forward on the rails close to the working face to be attacked, the tuyere is inserted and the blast turned on, a very fine stream of water is inserted of spray is introduced along with the blast. The flames are forced out of the front end of the furnace, and rise in contact with the face to the roof; the intense heat causes the rock to crack forces of splinters in such a manner that it is necessary for the workman to use a mask to protect his face. When any large cracks have been formed, so as to loosen masses of rock, the furnace is quickly withdrawn, and the face quenched with a stream of water, which must be led to the spot in a hose pipe. When the face is sufficiently cool to be approached the miners pull down and remove the loose pieces, when the furnace is pushed forward, as before. According to Hugon a level 4 ft. broad by 6 ft. high, at the Chalange Mine, in France, was advanced 5 ft. in 55 hours with this apparatus, whilst from 24 to 30 days were required for the same advance with two workmen blasting in the ordinary manner. Fire setting is usually carried on in three different ways, according to the portion or position of the rock to be attacked—viz., "Seitbrand," "Firstenbrand," and "Sohlenbrand," and which, for the want of better names, we shall designate respectively as end fire setting, roof fire setting, and floor fire setting.

End fire setting is generally effected by laying faggots of wood in an inclined position (about 70°) against the end or face to be attacked, sometimes directly on the floor, but best resting on a low wooden frame, or cross pieces. Shavings, and other readily inflammable substances are placed next to a leaning against the face, the back sides of the faggots being loosely covered with moist earth, &c., obtained in the mine, so as to concentrate the heat against the end. When fire setting is carried out at Ramelsberg, in the Hartz, on a large scale, several rows of faggots are not only placed behind but upon one another. The foundation upon which they rest is usually formed by placing two logs of wood at right angles to the face (that is in the direction of the level). On these several faggots are laid crossways in such a manner as to leave about 3 to 4 in. space between the faggots. On these the rest are piled inclined against the face. When the Prägelkatz is used for end fire setting, and for which it is most suitable, the smaller end is directed towards the face, so that the flames strike against and sweep the face. The sticks or faggots, about 2 ft. long, are placed in the frame and ignited, the sides and top being covered by sheet-iron plates, which are kept in their place by stones, &c., laid on the top and against the sides.

Roof fire setting, as might be expected, is the simplest and most effective. It is most usually carried out by first laying a couple of faggots or logs on the floor, and upon these a second at right angles to the first. The space between these is filled with light shavings or brushwood, by which the heap is to be ignited. On the second couple a third row is laid in a horizontal position, and crosswise with the one below. This row may consist of three or four faggots. The next row above is placed crosswise to this last, and may consist of four or five faggots; the heap is thus piled up to near the top or roof, the faggots being placed closer towards the top, in order to hold the fire better together until the whole has been burnt through. The lower portion of the pile being thus more open allows of a better upward current in the centre of the pile. When a considerable length of roof is to be attacked it is usual to place several piles at a short distance apart, and to ignite them simultaneously.

Floor fire setting is a very ineffective method of attacking the ground. When this is done simply by laying faggots on the ground and igniting them the top of the heap is usually covered with pieces of the lode or country rock. To attack the floor it is most advantageous to use some mechanical appliance, like Hugon's furnace, which we have described, in which, however, the opening is directed downwards.

In driving levels or drifts by fire setting it is most usual to commence the attack, and form a sort of advanced (3 or 4 ft. at most) drift by means of the Prägelkatz, and then to attack the sides and roof by end and roof fire setting. In working very thick lodes or massive deposits the attack is commenced in a manner similar to that in the case of drifts, the space is afterwards enlarged towards the side and roof by means of end or side setting and roof fire setting. After the fire has burnt out the pieces which have fallen are left on the floor, and a fresh pile laid upon them until the working has attained the proper height. It may even be necessary to build a temporary wall of loose stones, or to support the pile on cross iron bars, if the working is to be carried very high, and which will be done by roof fire setting. In narrow lodes over stoping will be carried on both by means of side and roof fire setting, under-stopping will be effected only by side fire setting. In order to prevent the sides of the lode being injured in cases where it is of importance loose stones will be piled against the walls of the lode on both sides of the fire to protect them.

Sinking can be but with difficulty carried by means of fire setting. The old miners before the invention of gunpowder in sinking commenced with a very narrow shaft, which were effected with the use of the gad or wedge and hammer, and afterwards enlarging by means of side fire setting.

The fuel employed in fire-setting is chiefly wood, best that which burns with considerable flame. The use of non-flaming fuel, such as coke and brown coal, can only be effective when the fire is kept up and promoted by mechanical means, and this applies to a great extent to the use of ordinary coal.

**THE APPLICATION OF WATER.**—In No. XXXVII. we noticed this as the last division under the head of hand labour. Water may work three ways by—1, swelling; 2, by softening, loosening, or dissolving; and lastly mechanically by carrying away material. Under the first of these heads it is chiefly in the swelling of wooden wedges which have been inserted in a dry state in cracks, and in such a manner is chiefly used in quarries; in collieries water is often thrown to the bearing dirt in undercutting, which causes the parting to swell and crack off. Its application under the second head comes essentially under that of methods of working, and we shall, therefore, defer its consideration to that section.

**MANUFACTURE OF STEEL.**—Mr. STEPHEN BARKER, of Knoxville, Tennessee, proposes to combine various kinds of cold blast charcoal pig, and work them in a common puddling-furnace. To fire the furnace he prefers to use bituminous lump coal. After the iron is melted, or while it is melting, he introduces 3 lbs. of pulverised magnetic iron ore, and mixes this with the melted iron; after this is well worked through the iron and the iron begins to boil, he adds the following chemicals with the damper down on the stack close enough to carry off the waste smoke—black oxide of manganese, about 1½ lb.; carbonate of soda, ½ lb.; pulverised oyster shells, 3 lbs.; common salt, 4 lbs.; soda ash, ½ lb. He does not boil the iron at such a high temperature as is required for making puddle iron for wrought-iron purposes, but keeps it at a proper heat so as to obtain the full effect of the chemicals. When the iron has been worked thoroughly and made into puddle balls it is drawn and hammered into blooms. It is then reheated in a common heating furnace, and hammered into flat bars. He cuts these bars up into small pieces, then puts these small pieces of iron into a common crucible with about ½ lb. of black oxide of manganese, 1 lb. of common salt, ½ lb. powdered oyster shell; these chemicals are introduced into the crucible when putting iron in for smelting. By

this invention the metals yield more readily than heretofore to the chemicals to produce their effect through the iron. By introducing the pulverised oyster shell a fine flux is given to the iron, which boils the iron and casts off impurities, and gives a fine grade of steel. In place of the oyster shells he may substitute wood ash in the same proportion; he has given the proper qualities of iron to be used, but it is well known that other brands of iron possess substantially the same properties, and may be used instead of those named without departing from the invention.

## NEW AND ECONOMIC AIR-COMPRESSOR.

During the past week a very simple and efficient air-compressor, the invention of Messrs. HATHORN and Co., of Charing Cross, has been kept at work in London, in order to afford an opportunity to those interested of judging of the value of the improvements which have been introduced. The compactness of the machine is all that can be desired, the steam cylinder as well as the air-compressing cylinder being mounted on a heavy cast-iron bed-plate hollowed to form the receiver. The essential features of novelty consist of a series of inlet valves and cylinders fitted into the outside covers of a main cylinder. The number of valves and small cylinders is determined by the size of the main cylinder. Each valve has an independent action, being thoroughly automatic and perfectly free from kinds of springs as now used in other air-compressors. The cylinders have centre guides for the valves, which are firmly screwed into the outside covers of the main cylinder. Around the air cylinder are set in a horizontal position, and immediately the piston in the main cylinder moves forward the valves are in operation, or open, and on the return of the piston they are closed, and the valves at the other end of the main cylinder are open to admit the air. The outlet receiving valves are also fitted into small cylinders in a vertical position on the top of the main cylinder. Around the air cylinder is a receptacle for a supply of water to prevent the cylinder getting heat when at work. It is claimed that this air-compressor is of extreme simplicity as regards its construction, and with about 40 lbs. to 45 lbs. of steam they are able to obtain a pressure of 120 lbs. of air, and taking ordinary working, 90 to 95 lbs. air-pressure appears attainable with 50 lbs. pressure of steam. It has been shown in practice that 90 lbs. pressure of air can be raised in about half a minute from time of starting. The air, moreover, is perfectly compressed without any loss of air.

The new compressor only requires from 30 to 40 lbs. of steam to work it with, and at that pressure sufficient air will be compressed to work four rock drills, each requiring about 40 lbs. of air. The machines require no masonry or other fixing, and can be set to work in a few minutes after being lodged on the ground close to the boiler from which it is to receive steam. It is also very compact and portable, the No. 3 size weighing about 2 tons. The advantage of the compressor will be apparent in those cases where the mines are situated in localities where the steepness of the approach or bad state of the roads render the transport of the machinery difficult and costly. When necessary the compressor could be taken to pieces, so that the largest would not exceed 10 or 15 cwt., which could certainly be carried wherever there are facilities for bringing away a cartload of mineral. It is understood that one of the Hathorn compressors is on its way to the Roman Gravels Mine, where it will be at once put to work to drive several of the Ingersoll drills, the highly successful working of which has frequently been noticed in the *Miner's Journal*. The particular form of drill has, of course, nothing to do with the success of the compressor, and there can be no doubt that in the few cases where rock drills have not answered expectation the disappointment has resulted more from the difficulty in obtaining a cheap supply of compressed air of suitable pressure than from any defect in the drill itself. The compressor will be illustrated and more fully described in a future *Journal*.

## CRYSTALS.

The following are some notes of a valuable lecture on Crystals delivered by Mr. J. H. COLLINS, F.G.S., before the Truro Young Men's Christian Association. The lecture was listened to with deep interest, and the lecturer heartily thanked.

Mr. COLLINS said: The term "crystal" is generally understood to apply to substances which are colourless and transparent, like rock crystal and glass. This, however, is not the scientific meaning of the term. Crystals may be of any colour whatever—transparent, semi-transparent, or opaque. The best definition of a crystal which I can give you is that it is an inorganic body, bounded by plane surfaces, formed by natural laws, and having geometrical relations to each other, and possessing a peculiar internal structure. Crystals, in fact, are among other things natural illustrations of solid geometry. Now, such a definition must, I am sure, sound very formidable to you. Let me endeavour to remove some of its terrors. Some of you have, I daresay, before now produced crystal baskets having a wire-work frame covered with sparkling alum crystals. Had you examined the separate crystals carefully, especially the smaller ones, you would have found them like this model, and like the sketch on the black board. Evidently they are bounded by plane surfaces, which are not in any accurate sense shaped by human hands. They were formed spontaneously, as we say, in a solution of common alum, anybody may obtain similar ones, and it is easy to get them of a large size. So far, then, our definition is realized; we have a body bounded by plane surfaces formed by natural laws. But these planes must have geometrical relation to each other. Let us see if this is so. The crystals themselves are too small to measure with this goniometer in the sight of my audience, but we have measured the inclination of each plane to each of its neighbours, and I find the angle to be close upon 109°. Now let us measure these models. Of course we do not expect quite such accurate measurements as we get in selected natural crystals, but here again we are near 109°. It is evident, therefore, that these plane surfaces have geometrical relations to each other. As to their internal structure, I shall have more to say, perhaps, bye-and-by. We will at present deal a little further with the forms of crystals.

In describing the movements of the earth, we are in the habit of speaking of its axis and its poles. Of course, no one supposes that the earth's axis has any real existence, or that the poles stand up like telegraph poles among the Arctic and Antarctic ice. The axis is an imaginary one, and the poles are simply points on the circumference, unmarked by any visible difference from the rest of the earth's surface in their vicinity. In like manner, when we wish to define the nature and position of the planes of a crystal, we make use of imaginary lines of direction termed axes, which are supposed to pass through every crystal. Recurring to our alum crystal, we can easily imagine three axes of equal length, and crossing each other in the centre of the crystal at right angles. Here is a representation of this supposition on a large scale. Now, we see that each axis meets, and so to speak, joins together a pair of opposite solid angles; the figure so produced is a regular octahedron, bounded by eight equal equilateral triangles. Now, I have already shown that these planes have a simple geometrical relation to each other, but it is far more convenient to refer all planes to these three axes. Taking the regular octahedron again, and first of all confining our attention to one plane, we see that it meets or "cuts" each axis at equal distances from the centre, and we therefore give it the symbol 1, 1, 1. Please observe that this is true whatever the size of the plane, the size only depending upon the distance from the centre, while the characteristic slope remains. If this point is once clearly comprehended you have crossed the *pons asinorum* of crystallography. Let us see if we cannot apply this knowledge a step farther. [The lecturer has made models here illustrated the derivation of the cube, the rhombic dodecahedron, &c.]

I have now to call your attention to another law, that of hemihedral development. This simply means the development of one half the planes and the suppression of others. Suppose an octahedral crystal of alum placed in a saturated solution of alum it would gradually get bigger, from new particles attaching themselves to each plane. But suppose further that from some cause or other only each alternate plane received this increase, we should after

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrath, Dr. von Groddeck, Director of the Royal Bergakademie, Clausthal, The Hartz, North Germany.

time get this result, and at last this (showing models), which is called a tetrahedron, or four-sided figure. You will observe that it is bounded by four equal equilateral triangles, and I may tell you that these are always inclined  $80^{\circ}$  to each other. Now the planes of the tetrahedron, like those of the octahedron, meet or cut each axis at equal distances from the centre, so that its symbol should also be 1.1.1, but to make a distinction the sign of division is used, 1.1.1. I must carry you one step further before leaving this

1.1.1. I must carry you one step further before leaving this  
subject of crystal form, and that is to the combinations of form.  
The lecturer here gave illustrations of combinations of form, showing  
the cube octahedron and cube rhombic dodecahedron.] Perhaps  
you will say all this is extremely simple, but the natural crystals I  
see are very rarely like either of the models you have shown me,  
and some are very complex indeed. This is very true, but I assure  
you they are all derived from systems of imaginary axes according  
to the laws I have indicated. [Here the lecturer illustrated the six  
systems of axes.] We will now pass from crystal form to crystal  
mineral. An immense number of substances known to the chemist,  
like glycerine and oil, seem to have no tendency whatever to  
crystallise under any circumstances. Others, like sugar or alum,  
are ready to crystallise if you only give them the opportunity.  
The first are called colloids, the second crystalloids. It is with these  
we have to do this evening.—Mr. Collins, in conclusion, ex-  
plained the formation and character of many crystals.

## COLUMBIA AND CANADA

The connection, social and commercial, between the English-speaking people of the Old World and the New is so intimate that my account of the peculiarities of domestic life in one is read with pleasure in the other. It is not many years since that we favourably noticed an interesting little volume entitled "Westward by Rail," by Mr. W. FRASER RAE, and the same gentleman has now given us an equally interesting narrative of travel\* by way of supplement, which will prove equally acceptable to readers of this class of literature, whilst from the large amount of facts which he has embodied in the narrative the book will, we have no doubt, be very widely read by those desirous of obtaining accurate and interesting information connected with the history of several of the useful inventions of the last century, not the least attractive of which is his reference to the infancy of steam navigation. Mr. Rae remarks that two citizens of the United States—James Rumsey and John Fitch—were amongst the earliest experimenters in steam navigation. Rumsey designed a steamboat which was to cross the Atlantic in 15 days, but died with his dream unfulfilled. Fitch was also the victim of great disappointment. In 1786 he propelled a vessel by steam power against the current of the Potomac at the rate of five miles per hour, and one of his steamers plied for a time on the Delaware in 1788. An engine moved a series of paddles through the water like canoe paddles, worked by hand, and a speed of seven miles per hour was attained. Fitch, however, failed to obtain the support of capitalists, whilst "sensible" men remarked "Poor fellow, what a pity; he is crazy!" An indisputable proof of the necessity being that when requesting a loan of 50*l.*, wherewith

an insanity being that when requesting him to complete his second steamboat he declared in writing—"This, or whether I bring it to perfection or not will in time be the model for crossing the Atlantic for packets and armed vessels." He committed suicide in 1798. It seems that 45 years after Dr. Lardner, we may if we might judge by the light of our present knowledge, more than Fitch; for he stated in a public lecture, after admitting the possibility of a steamship making a trip from Valentia in Ireland to St. John's in Newfoundland, he added—"As to the project, however, which was announced in the newspapers of making the voyage directly from New York to Liverpool, it was, he had no hesitation in saying, perfectly chimerical; and they might as well talk of making a voyage from New York or Liverpool to the moon." It is now unquestionable that Mr. Symington perfected the earliest engine which transformed the steamboat from a theory into a reality; his model has been followed by all succeeding designers of marine engines. With Symington's engine a paddle-boat on Dalswinton Loch made five miles an hour, and in 1802 the Duke of Bridgewater ordered eight boats of him, but the Duke dying soon after, his successor rescinded the order, and Symington died a pauper. In 1793 Robert Fulton, a native of Pennsylvania, succeeded

In 1795 Robert Fulton, a native of Palmyra, New York, succeeded in moving a boat through the water by steam with a screw propeller, and for a time he was successful, but he died in 1815—a neglected, heartbroken, and ruined man. After a beginning in steam navigation had been made the progress was rapid. In 1815 a steamboat appeared on the Thames, and in 1819 the first steamboat (the *Manhattan*) crossed the Atlantic. Altogether Mr. Rae gives a readable account of the early history of steam navigation, and his description of the voyage is also good. Referring to New York, he complains of the Customs' practice of requiring a legally affirmed declaration that the list of the contents of his luggage is correct, and then deputing an officer to search the luggage for smuggled goods, but all travellers well know that customs officers are very expert in detecting suspicious-looking characters, and that similar complaints to his are heard with regard to the customs officers in all European countries, although three-fourths of the travellers find them obliging and polite. At New York, as elsewhere, the officers are declared by impartial observers to treat travellers precisely as the travellers treat them; an agreeable man, who can refrain from the silly habit of joking with strangers, and especially when he is unacquainted with the general disposition and notions of those whom he is addressing, seldom finds cause to complain. On the same principle, many might complain of the literary style of Mr. Rae's volume, but the majority, who will read it for information and amusement, and not for the purpose of criticism, will be quite satisfied with it. He appears to rejoice at the downfall of Tweed and his colleagues, but he asserts that the purer administration of justice the cost had made 'no notable improvement in the paving and so on'; altogether, his opinion of New York is not remarkable.

Philadelphia, Mr. Rae remarks, covers nearly 130 square miles, being 22 miles long from north to south, and from five to eight miles in breadth. There are upwards of 350 miles of paved streets within this area, those running east and west bearing the names of trees—as cherry, chestnut, walnut, spruce, and others, whilst those running at right angles bear numbers, so that the finding of a given street is very easy. The laws by which Pennsylvania is governed are notable for an entire absence of taxation, the state being entirely

as notable for an antiquity almost exceptional throughout the American continent. Laws made in 1704 are still in force, and he observes that this proves that the colonial legislators under the Monarchy to have been quite as capable as their successors under the Republic, and may be said to give fresh point to the well-known *adage* that the best form in which Pope puts good administration as the criterion of the best form of government. The Centennial Exhibition; Philadelphia during the exhibition; the Press and the people of Philadelphia; the District of Columbia; the Capital of the Union; the Capital of the Commonwealth of Massachusetts, Saratoga, and West Point; and the Saratoga Springs, each form the subject of a separate chapter and

and some of his observations are especially worth noting. It appears that when the first number of the Philadelphia Public Ledger was issued Mr. Russell Jarvis, the editor, in an address to the public, gave Great Britain the credit of having an engine of instruction in a Cheap Press, which other countries might envy. Upon this Mr. Rae remarks that unless he meant by this such publications as the Penny Magazine it is difficult to understand what he could have referred to. As to the reason why the District of Columbia has no State rights, and sends neither senators nor representatives to Congress, Mr. Rae has evidently made no enquiries and, therefore, is incompetent to discuss any question in which the District of Columbia is concerned, the natural result being that his chapter under that title gives indisputable evidence of glaring misapprehension.

The remaining chapters of the book are devoted to accounts of  
trip through Canada, and of the homeward voyage, and contain  
"Columbia and Canada: Notes on the Great Republic and the New Dom-  
estic Empire. A Supplement to "Westward Ho," Part II.

considerable amount of instructive and entertaining information with regard to the Province of Ontario, travellers and bankers in North America, and the city of Toronto. In the concluding chapter Mr. Rae offers a rather curious suggestion. He remarks that a great scheme of confederation between Great Britain and the United States has been proposed, but no agreement as to its terms has yet been arrived at. He suggests that better than any treaty, far simpler than such a scheme, and a prelude to the adoption of one hereafter, would be an Act of Parliament of the United Kingdom and an amendment of the Constitution of the United States giving the citizens of the Republic and subjects of Queen Victoria common citizenship in the Anglo-American empire. The volume is certain to meet a good reception from all classes, and will add to the reputation which the author's former works have gained for him, a

FOREIGN MINING AND METALLURGY

FOREIGN MINING AND METALLURGY.

There is nothing very novel or interesting to report with respect to the French iron trade. The general situation remains much the same, and it is feared that political uncertainties will prevent any improvement taking place for some time to come. Prices show scarcely any variation. The French Customs Returns for the first nine months of 1877 do not exhibit very favourable results so far as the French iron trade is concerned. Thus, as compared with the corresponding period of 1876, the imports of pig exhibit an increase of 17,000 tons, this increase arising almost entirely under the head of imports with payment of duties. As regard iron and plate, the imports exhibit only a slight augmentation, upon the whole, but it may be noted that 4000 tons less iron were imported free of duty, and that 5000 tons more iron were imported with payment of duty. This comparison shows tolerably clearly the decline which has taken place in the exportation from France; upon the whole, this decline appears to have been 27,000 tons upon a total of 166,000 tons. Negotiations with reference to the renewal of treaties of commerce are stated to be meeting with considerable difficulties. The present crisis has communicated a new vigour to Protectionist ideas; everyone feels himself weak, and looks in consequence to tariffs for assistance.

assistance. Although the weather has not at present become very cold in Belgium, preparations for the winter continue to be made. There is good current of orders for coal for domestic purposes, and this state of things, if it has not revived prices, has at any rate given a certain firmness to the market. Deliveries have been made upon a large scale to Paris, which has been looking for supplies of coal from Belgium in quite a serious fashion. Coal for industrial purposes, although metallurgical industry has moved on rather sluggishly, has also been in somewhat better demand; this is due to the fact that some orders have been given out lest frosts should check deliveries on the navigations. This temporary activity may perhaps become more decided for a few days, but there cannot be said to be any definite improvement in affairs.

The weather has been rainy and unsettled in France, but there have not been any very rough variations of temperature. As the present political situation is full of uncertainties large orders have been rather scarce. In domestic coal there has, on the contrary, been a very satisfactory activity, and both consumption and the quality of the deliveries have exhibited a sensible progress. Prices have remained the same, but they have rapidly hardened, and an advance in domestic qualities is regarded as probable. Industrial qualities have been rather neglected, although there have been some good surprises as regards the sugarworks, the beet root crop having proved a better one than was once anticipated. This has led to the receipt in the Nord and the Pas-de-Calais of a certain number of supplementary orders, which have been very welcome. A great exhibition of coal has just been opened at Hamburg. The exhibition afforded an illustration of the mineral wealth of Westphalia, and it appears to be considered that the workable beds now known to exist in that part of Europe will be sufficient to provide for the consumption of Germany for more than 5000 years. The death is announced of M. Victor Dubochet, President of the Parisian Gas Company. M. Dubochet, who may be said to have created the company, has left a very large fortune. The Naval and Railway Blast Furnaces and Forges Company has announced the payment of a dividend of 18s. per share.

The John Cockerill Company has obtained a contract for 3000 tons of steel rails for a Russian strategic railway. The Russo-Turkish war has not been without some profit to Belgian industrials. Iron barracks, arms, rails, pontoons, have all been ordered in turn by the Russian Government to complete its war *material*, and the continuance of hostilities leads to an anticipation that Belgium will still find in the East some outlet for her products. The price at which the 3000 tons of steel rails just ordered are to be delivered remains a mystery, it is either very low or very exaggerated, and opinion appears to incline towards the latter hypothesis. The rails are to be delivered within a very brief period, and great efforts and even sacrifices are to be made in order to attain this object. The Belgian Metallurgical and Colliery Company has had for some time in warehouse at its Tabize Works 12 locomotives, which had remained on their hands in consequence of the failure of the coal basins of the Hainaut Company. The manufacturing company has just sold these engines to a foreign client; five of them were dispatched this week, and the others will follow. The engines are of the type used on the Belgian State lines, and they are quite new. The Belgian Metallurgical and Colliery Company has been negotiating with an external client a rather important contract for goods trucks, but the result of the negociation has not at present transpired. The Belgian Company for the Construction of Engines and Railway Plant has just secured a contract for four locomotives to be delivered immediately. The St. Leonard Company, at Liège, has further obtained an order for two engines, and the John Cockerill Company for four, the whole being required for exportation. These engines having been made speculatively in advance during times of depression can now be delivered at once. The sale of

locomotives thus announced is calculated to give courage to Belgian industrials. A ship of 1000 tons burthen has been launched by the John Cockerell Company at Hoboken-les-Anvers; this ship intended for the conveyance of minerals from Somorostro, near Bilbao, and a second vessel of the same dimensions is in course of construction in the same yard. A contract of 500 goods trucks for the Rhenish Railway is to be let on the 15th inst. at Cologne.

The Paris copper market has remained without animation, and the article has fallen slightly. In Germany the transactions in copper have been unimportant, and prices have experienced no change. Tin has been firm at Rotterdam, although transactions have not presented much importance. For Banca as much as 42½ fl. has been paid; in Billiton transactions have taken place at 41½ fl. At Paris tin has been rather firmer. The German tin markets have also been well supported. Lead has sustained its price at Paris, but transactions have been unimportant. The German lead markets have run firm. There has been little business passing in zinc at Paris, prices have been supported. The German zinc markets have

**ANTIFRICTION BEARINGS.**—The use of revolving rollers for bearings has not hitherto proved very successful, but Mr. JOHN ROBISON, of Sheffield, has invented some improvements which he believes will remove the difficulties which have been encountered. In the construction of a bearing for ordinary purposes he provides seven rollers of equal lengths and diameters, and each having an annular groove or neck, turned or otherwise, formed at a short distance from each end; he then prepares two circular frames, the internal diameter of which slightly exceeds the diameter of the shaft to which the bearing is to be applied. Each frame consists of four semi-circular plates or pieces, forming when put together two washers, complete circles, one washer having slots corresponding in size to the necks of the rollers and opening to the outside, and the other washer having similar slots opening to the inside, thus when two washers are put together and the slots opposite each other,

ing circular holes at equal distances round the washer, thus keeping the rollers equidistant. The four parts of the frames are secured by screws or other suitable means. For some purposes he prefers to turn a single groove in the middle of the rollers, and in that case only uses one frame, and in the case of long bearings he may use the two end frames and a centre one combined. According to another modification, he simply uses solid circular washer-shaped frames with the slots, having rounded ends opening to the outside into which the necks of the rollers are dropped. The rollers in all cases are of larger diameter than the width of the frame, and, therefore, project beyond the inside and the outside of the frames, so that the shafting revolves on the rollers clear of the frame, and the outer surface of the rolls revolve and bear on the pedestal, or other bearing frame, causing the entire frame and rollers to revolve. Thus the entire frame with the rollers revolves round its own axis as well as each roller revolving round its own separate axis. By constructing the frames in parts in the manner herein before described facility is afforded for applying the roller to sunk necks and positions otherwise inaccessible. The number of rollers, as also their lengths and diameters, may be varied according to circumstances. They may be composed of any suitable material, but he employs by preference hardened steel for the purposes

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**ROLLING AND FINISHING ANGLE IRON**

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ROLLING AND FINISHING ANGLE IRON.

Some two years since some improvements in rolling strip, hoop bars, and other sections of iron or steel, were patented by Messrs. W. BROWNHILL, jun., and T. H. SMITH, of Walsall, and they now propose further to apply the invention in carrying out another form of improvements in the manufacture of angle iron and other sections hereinafter mentioned, in the production of which it has hitherto been formed from the pile, after breaking down by being worked through angular grooved rolls, and delivered from them in a finished condition, from which it will be understood that the meeting of the finishing grooves represents (in the hollow) the exact counterpart of the angular section desired to be rolled; that is to say, the true form and extent of the sectional angle, has been imparted to the iron from the form of the grooves through which it has passed from the heated pile to the finished angle. Angular iron thus produced has the disadvantage of being restricted in its length, as also of not being evenly worked or rolled down from the pile in its granular structure; but by their improved means of rolling they purpose reducing the pile to a strip or bar of the required thickness and finishing on the edges, an operation done with unusual rapidity, as the strip when rolled is still in a highly heated condition, which they utilise by at once pointing or shaping the strip so formed, and sending it through angular grooved rolls working in the same or other convenient train, thus converting the strip technically into angle iron, in which process great diversity of size and shape may be imparted as, for instance, the angle of the iron may be right, acute, or obtuse, a positive angle on its exterior, and rounded and strengthened on the interior, or rounded both in the interior and exterior; or one flat portion of the angle may be narrower or wider than the other, and the length limited to the size or quantity of metal in the pile or bloom under.

in working large bodies of iron the workable heat is longer retained, so that after rolling the pile or bloom flat by the two-roll principle, the flat bar will still retain sufficient heat to pass through shaping rolls to give it the desired angular form. By thus producing angles from regular or irregular strips or bars they are enabled to produce them of large size and great length, down even to the conversion of ordinary hoop iron, direct from the pile or bloom to the finish; and in like manner by alternating the combined shape of the finishing grooved rolls they are enabled to roll channel or other sections that may be required, observing that they do not purpose making their angles or other sections of strip or flat iron of a uniform thickness, as in some instances, where additional strength is required either in the angle or at the edges of the planes of the angle, they roll the strip or bar of unequal thickness as required.

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## FURNACES FOR BURNING SLAG

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FURNACES FOR BURNING SLACK.

Although it is much less difficult at the present time to find a market for slack than it was a few years ago, the advantage of utilising it in furnaces and without preparation can scarcely be over-rated. In connection with the invention of Mr. FREDERICK HART, of Tavistock-road, the steam-boiler employed consists of an upright cylinder or cylindrical shell, closed at the top and bottom, and within it there is a drum of similar form and of such dimensions as to leave a water space all round between the shell and the drum within it. There is also a space over the top of the drum such as to provide adequate accommodation for the steam and permit at the same time of the top of the drum being always covered by the water in the boiler. Vertical water tubes pass through the drum from top to bottom; the furnace communicates with the interior of the drum by a slit or opening formed partly around the bottom and lower part of the side of the drum, and at a point opposite to this slit or opening there is another passage through the drum and the outer shell leading from the interior of the drum to the chimney. In order to accommodate the furnace the outer shell of the boiler is cut away at the part corresponding to the slit or opening in the drum, and here the shell is connected with the side of the drum in such manner as to form a hanging bridge extending partly around the boiler. At this part also the bottom of the drum is connected with the outer bottom, and so a cavity is formed extending partly underneath the boiler. This cavity serves as an ash pit; the ash pit, however, extends beyond the outer shell of the boiler fire-bars from the top of it, and it is closed underneath by doors, so that there is no free admission of air beneath the fire-bars. The parts of the fire-bars which project beyond the outer shell of the boiler are inclined upward so that their outer ends rise as high as the under surface of the hanging bridge.

The supply of the fuel is entirely distinct from the air entrance, which is never in any way interfered with. At some distance above the fire-bars there is a hopper to receive the slack to feed the fire and the fuel descends from this hopper through a comparatively narrow channel, which, however, widens rapidly as it approaches the part of the furnace where the small coal commences to swell with the heat. Between the lower end of this channel and the fire-bars the fuel forms a heap resting upon the fire-bars and against the outer side of the hanging bridge; on the outer side of the heap curved bars or plates are provided to keep the heat within due bounds so that there may not be too great a thickness of fuel, but these bars or plates are arranged to obstruct as little as possible the free access of air to the outer side of the heap. The small fuel commences in the lower part of the channel leading from the hopper and forms lumps between which afterwards the air is able to pass freely. The fuel so caked into lumps forms a heap on the fire-bars, and the air striking downwards through the outer side of this heap, and passing through it and beneath the hanging bridge, effects the combustion. The ashes fall through the spaces between the fire-bars into the ashpit and are removed from time to time. The ashpit is air-tight except whilst the ashes are removed, so that there is no draught through the bottom fire-bars. Mr. Hart cases in the channel descending from the hopper and also the front of the pile of fuel, and causes the air to pass through the casing around this channel as it goes to supply the combustion; thus the channel is kept cool up to the point at which it is desired that the heating should commence, and partially heated air is supplied to the fire; loss of heat by radiation

Although the primary object of the invention was the generation of steam it will of course be understood that furnaces and fire-places constructed in the same way may be used for various purposes. The furnace or fire-place, as constructed without the steam-boiler, consists of, first, a throat or narrow channel for the slack to descend to the furnace; the lower end of this channel widens rapidly as it approaches the part of the furnace where the slack commences to swell with the heat; immediately below the mouth of the channel, both at the front and back, or all round, are placed inclined or level bars still further to restrain the slack, and at the lower end of the channel, the six incising

through these bars becomes mixed with the gas given off by the coking coal and passes downward through the incandescent part of the fire. At the bottom of these bars there is a fire brick or water bridge at both back and front, or only at the back, as desired; the lower edge of this bridge is some distance below the point where the coal loses all its gas. At a sufficient distance below the bridge to allow the required area for the escape of the products of combustion is the floor of the furnace, which floor extends beyond the bridge to rather more than the height of the bridge from the floor.

### Greetings of Public Companies.

#### WHEAL UNY MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Austinfriars, on Wednesday.

Mr. R. McCALLAN in the chair.

Mr. JAMES HICKEY (the secretary) read the notice convening the meeting and the minutes of the preceding one, which were confirmed. The statement of accounts for the quarter ending September, showing a loss on the three months' working of 192. 14s. 1d., and a debit balance of 1469., together with the subjoined report of the agent, were submitted:

Oct. 29.—Since your last general meeting we have been urging on the different points of operation on the mine. The rise in back of the 60 west is worth 6s. per fathom; there is a great deal of unexplored ground between this level and the 40, and we hope the lode will improve as it is being opened out. The stopes in the back of the 110, east of King's, is worth 10s. per fathom. Two stopes in the back of the 120 east are worth 8s. and 10s. per fathom respectively. The 130 east, east of King's, is worth 8s. per fathom. A stop in the back of the 130 east is worth 12s. per fathom. The 140 east is worth 12s. per fathom. Three stopes in the back of this lode are worth 30s. per fathom in the aggregate. The 150 east, east of King's, is worth 8s. per fathom, but looking at the run of tin ground in the 140 east we ought soon to have an improvement in this level. The 150 east, west of incline shaft, is worth 8s. per fathom. A stop in the back of this level is worth 15s. per fathom. The rise in the back of the 160, east towards Gooding's shaft, carries stones of tin; this rise is intended to make Gooding's shaft good for haulage through from the bottom of the mine, as well as for ventilation. The 160 east, west of incline, is worth 10s. per fathom. A stop in the back of this level is worth 10s. per fathom. Hind's shaft below the 160 is worth 25s. per fathom for the length of the shaft—14 feet. The mine, on the whole, is looking well. We have sold a greater quantity of tin (5s. tons) during the past twelve weeks than has ever before been raised in the same period of time, but we regret to state the average price has also been lower than hitherto. A few years ago the tin sold from this mine brought 93s. 10s. per ton, but during the past quarter it has fallen to 37s. 8s. per ton. We are, however, encouraged to persevere by the hopeful state of the tin market. Our tin ore now makes 4s. 5s. per ton in excess of what we had to sell for two months since. We hope soon to see at a fair average price, when this mine would do well.—WILLIAM RICH, MATTHEW ROGERS, JOSEPH RICH.

The CHAIRMAN remarked that upon reference to the accounts they would notice that a greater quantity of tin had been sold during the quarter than in any previous three months, but unfortunately those sales had been effected at a lower average price. He was glad, however, to say that the depression which had so long been observable in the market appeared to be now passing away, as a very gratifying upward movement appeared to have now fairly set in. They had, it was true, made a loss of about 190/- upon the quarter's operations, but the meeting would be glad to learn that even at the current rates of to-day not only would they have shown no loss, but a small profit would have been the result. The next matter which would have to receive their consideration was the financial condition of the company. They would remember that at the last meeting it was considered desirable that the question of making a call should be postponed in consequence of the general depression which was then prevailing; now, as a material improvement appeared to have taken place he thought a call ought to be made to pay off the existing balance and place the mine in a sound position. With regard to the mine itself, and the operations going on there, they had heard the agents' report read, and were, therefore, as well informed upon the subject as himself; but he might congratulate them that the property was looking better than at any previous time. He had told them that the upward movement in the tin market had already commenced, and he thought the meeting would agree with him that to look forward to 50/- per ton for tin was not entertaining an extravagant expectation; yet at that price, with no more than their present returns, they would be able to give a 5s. dividend. He was not aware that there were any further observations which he had to make, but if any additional particulars were desired, either as to the accounts or the operations at the mine, he would have much pleasure in answering any enquiry which the shareholders might have to make. He concluded by formally moving the resolution for the adoption of the report and accounts.

Mr. W. PRICE said that there was no question that the tin market showed signs of permanent improvement, although from the large number of "bears" at present operating in the market there might be even a temporary decline. The general feeling in Cornwall was decidedly better, and this would not be unless there were grounds for it. It would be noticed that within the past few weeks some properties had doubled, and even more than doubled, in value. Dolcoath, Carn Brea, Tincroft, and other mines in the same neighbourhood being among the number. There had been a panic not long since, and much had been said of the heavy debts for which some mines were liable; but he could assure them that the majority of miners in Cornwall thought very little of a heavy debt if they had a good mine, as a comparatively small advance in the price of mineral soon enabled them to pay off it.

A SHAREHOLDER understood that it was proposed to make a call, and asked what the amount would be?—Mr. HICKEY said that the committee considered a call of 4s. per share would be necessary, and probably the meeting would be of the same opinion.

The call of 4s. per share was then formally proposed and unanimously agreed to, and, thanks having been voted to the Chairman, the proceedings terminated.

#### VALE OF CONWAY LEAD MINING COMPANY.

The first annual meeting of shareholders was held at the mine, near Llanrwst, on Saturday.

Mr. HUGH PUGH (Mayor of Carnarvon) in the chair.

The SECRETARY read the notice convening the meeting. The reports of the directors and agent and the accounts were adopted.

Mr. ROWSE, the managing director, stated that the company had only commenced operations since April last, and he thought that everyone who had inspected the work which had been accomplished would be fully satisfied that it had been carried out most thoroughly and economically, and reflected great credit on Capt. Roberts.

Mr. HARVEY (director) fully concurred with the statements expressed by Mr. Rowse. He had visited the mine in May last, when little had been done, and on the surface preparations only were being made. Now they had erected a water-wheel and crusher, together with the necessary buildings, 200 yards of tramways had been made and laid down, two long tramways had been completed to the dressing floors, the latter being also new. Everything had been arranged by the manager and agent to meet the requirements of a large development of the mine, and he could congratulate the shareholders on the workmanlike manner in which all the details had been carried out.

Capt. ROBERTS, the resident agent, said that the prospects of the mine at its present stage of development was very encouraging. The east and west lodes were especially of a very promising character. He did not consider that so much importance should be attached to the time it would take to intersect the Rabbit lode; for whether he had 10 fms. or 20 fms. further to drive before reaching that point, it should not be lost sight of that such driving was all on an ore-producing lode, and that stoping ground would be opened up to the intersection of the lodes. He had already extracted a large quantity of leadstuf, which was now ready for the crusher. This lode having proved very productive in the adjoining mine gave additional interest to the workings in our mine. We shall shortly, at a trifling outlay, bring in another level deeper than the one we are now driving, which will open up a long run of stoping ground, materially adding to the pairs at the crusher house. There were several other important points to be considered. The main north and south lode is a large well defined lode, and one of the most productive in this district. A good run of lead is to be seen in the bottom of the old mine, which can be drained by bringing in a stop of ground about 10 ft. high; and by continuing the adit level as far south as the junction of the counter lodes, he believed that a larger quantity of ore would be met with than has yet been seen in the mine. By driving north we shall be getting under a long run of old workings, which has yielded considerable bodies of ore, and obtain 10 fms. of untouched ground. By these drivings one or two counter lodes running into the mountain would be opened up, and by driving a short distance from their course from 50 fms. to 60 fms. the backs would be won. Taking what he had mentioned into full consideration, as well as the other points which would occupy too much of their time to dilate on, he believed the mine will eventually exceed anything yet anticipated by those who had seen it; for his own part he had advised his friends to invest in the shares of the company.

Mr. ST. STEPHENS remarked that having inspected the mines for the directors in August of last year, previously to the formation of the company, he was pleased to find that his report had so far been fully realised; and from the observations he had made that day and the appearances presented in the breast (and

winze adjoining) of the end or lode, he was the more convinced that the company possessed a very valuable mineral property which would be long be acquired after by investors in lead mines.

The retiring directors were re-elected, and Mr. de Metz, the auditor of the company, was also re-elected.

At the conclusion of the business of the meeting the shareholders assembled around the crusher-house to inspect the machinery and water-wheel, which had been recently erected, and to formally set the latter in motion. On the water being turned on the wheel revolved with considerable ease, the various parts of the mill being so nicely arranged and neatly fitted that the operations of crushing, jiggling, and grinding were effected with a smoothness and quietness surprising even to the initiated. There was a thorough absence of that jolting and jerking which always attends the crushing of such hard rock as was provided to test the machinery. Great credit is due to the manufacturers, the Sandycroft Foundry and Engine Company, for the completeness and workmanship shown in the construction of the wheel (30 ft. diameter), and the various bearings of the mill, and to the managing director (Mr. Rowse) and Captain Roberts for the efficient manner in which the works had been planned and laid out, considerable satisfaction being expressed by all present.

#### TRELEIGH WOOD MINE.

At a general meeting of shareholders, held at the office of the company on Wednesday (Mr. T. V. SMITH in the chair), a statement of account showing a cash balance in hand of 1031. 16s. 1d., and of liabilities and assets (including the estimate of costs and returns for the next three months) showing an estimated balance against the mine of 2117., was laid before the shareholders, and passed. Capt. W. Goldsworthy, having been requested to attend this meeting, was questioned as to the present and future prospects of the mine, and gave it as his opinion that with a further rise in the price of tin there would be no difficulty in making the returns equivalent to the expenditure, and it depended on any further advance in the standard as to whether a permanent monthly profit could be made, seeing that the monthly sales had increased it might be supposed that the mine was being worked unfairly, but he assured the meeting that such was not the case, and that he was discovering more ore than he was taking away. As tin advanced, so he would be enabled to take away ground that could not be worked at present except at a loss. He had every reason to believe that with the present standard he could bring to market from 11 to 12 tons of tin per month without materially increasing the cost and without injury in any way to the property. There were three ends being pushed on with all speed, and he hoped the 34 fm. level would soon reach the shoot of ore which had proved so productive in the level above.

On discussing ways and means, the SECRETARY stated that there were ample funds in hand to considerably reduce the liability to the merchants (1800/-), and he hoped, with an improvement in the price of tin, to clear off the remainder of the debt before the next meeting.

Mr. LAWS stated that the last sale left a profit, and he hoped, from what he had heard from an independent report, that his estimates of the next three months' sales might be considerably augmented.

The estimated balance against the mine being but 200/-, no call was deemed necessary, and the meeting separated.

**FRONTINO AND BOLIVIA GOLD MINING COMPANY.**—At the meeting of shareholders held yesterday, at the Cannon-street Hotel, the report and accounts were adopted. The proceedings were of a satisfactory character, and the reports from the mines are encouraging. The disastrous revolution with which the States of Columbia were visited in August, 1876, and which continued until March last, had the effect of reducing the number of men at the mine. The revolution is now entirely suppressed, and those best informed on the subject are of opinion that the States may now look forward to a long period of peace and commercial prosperity. This is what is chiefly required to allow of the full development and working of the mines and the return of handsome dividends to the shareholders. A full report of the proceedings will appear in next week's Journal.

**WESTERN ANDRS MINING COMPANY.**—At the meeting of shareholders yesterday the report of the directors was adopted. A report of the proceedings will appear in the Journal of next week.

### Original Correspondence.

#### THE LISBURNE MINING DISTRICT—THE CARON LEAD COMPANY.

SIR,—I have read with pleasure in last week's Journal Capt. Kneebone's interesting letter on the above mine, and I consider it satisfactory to find his opinion so confirmatory of all that was stated at the recent meeting of the company. I can fully agree with Capt. Kneebone as to the prejudice that certain persons exhibit towards the opening up of fresh mines in the locality treated of, though why it should be so I cannot explain, as I should imagine that the more the development of the mineral resources of the Lisburne district is extended the better it would be for all parties interested in its welfare. With respect to the Caron Mine itself, no person who sees it, even though his knowledge of lead mining be most superficial, can fail to do otherwise than at once form a good opinion of its capabilities. The present works are, it is true, shallow, but the extent of ore ground already laid open for upwards of 50 fathoms in the adit level, and for a considerable length in the other levels, is in itself such a sight as can very seldom be seen in young mines, even in this famous district, and there are apparent in the lode all those indications of improvement at greater depths which practical miners delight in observing.

This mine has doubtless yielded a good deal of ore from ancient workings on the top of the lode, but nothing to what may be expected from deeper and more scientific development, for, as Capt. Kneebone truly remarks, the lode, though narrow at the top, gradually increases in size and value down to the bottom of the shaft, and there are many unmistakeable indications that such improvement will increase as greater depth is attained. The lode itself is extremely well defined, it runs parallel to the celebrated Lisburne, and other productive lodes, and is identical with them in external features and in geological structure. I consider that the remarks made by Capt. Kneebone that it is "very similar to the rich Glografach lode," ought to be very satisfactory to the Caron shareholders, for I understand that that lode has yielded something like 10,000 tons of lead.

Considering that the company is amply provided with capital (every share having been taken and allotted), and that the local management has been entrusted to vigorous hands (Mr. J. Kitto, of the Grogwinion Mine being the manager), I feel every confidence that the mine's development will be both rapid and profitable, and I look upon the concern as one of the most legitimate investments that has been submitted to the public for a very long time.

—A SHAREHOLDER.

#### NEW QUEBRADA MINING COMPANY.

SIR,—I desire through your widely-spread Journal to make an observation and utter a word of warning to my co-shareholders. In the circular which the Quebrada board issued some days ago there was their usual assurance of wishing the shareholders to know all they knew. They knew at that time (among other things kept back) the date of departure from England of the person they had selected to go out to the mines as assayer and ore-assorter for the company. Of course if they had given us that date we should have been in a position to estimate pretty exactly the time of his arrival at the mines. This (read now by the light of a private letter from the Quebrada property) is, to me at least, of no trifling import. The letter referred to states most distinctly that the assayer sent out had reached the mines, and was preparing two cargoes of ore, which it was believed would show at Swansea an average of copper equal to 23 or 25 per cent. It has occurred to me that if the directors in their recent circular had wished to be so fair towards us as they would have us believe, why did they not plainly say to all shareholders—"Our assayer sailed hence on a certain date, he will reach the mines by another certain date, will at once proceed to select for us by actual assay a cargo or two of high-grade ore, and we may expect a very different result from 8 per cent, by about such and such a date." This would have been a just course. But to let shareholders in scores rush and sell out their holdings in the company, as they have within the past ten days done, when the knowledge I

have cited would have saved them from so doing, is, to say the least, in my opinion, not a course worthy of honourable business men.

Again, are the shareholders aware that a most favourable arrangement for uniting the Bolivar Railway and the New Quebrada Companies is rapidly maturing. If not, I can tell them such is the case. Have the board any personal interest in keeping this latter fact quiet? More anon.

Shepton Mallet, Nov. 1.

AN OLD SHAREHOLDER.

#### FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR,—In the Journal of last week, under the head "Flagstaff Edgerton," which my directors think you would not have made had Mr. Edgerton is not, and never was, a "servant of the company" nor has he ever been authorised to act in any way on the company's behalf. The letters in question were addressed to the Chairman of the company, and were laid before the Board as a matter of course. They were of a most scandalous character, and the statements therein, as well as those made in subsequent letters to the Utah papers, will receive their refutation in due course.

Great Winchester-street, Nov. 2.

A. DR METZ,

#### FLAGSTAFF MINING COMPANY.

SIR,—As a large holder in Flagstaff shares, and as one who must confess that he looks to the columns of your valuable Journal for almost every item of information which he gets with anything like punctuality respecting this company's affairs (as if the board tell us anything at all it seems to be weeks "after the feast"), I write now to ask the directors flatly whether they, or any one of them, is in possession of a full account of the very recent discoveries in the mine? Intelligence of great importance to the shareholders at large has been received by different parties in different quarters during the present week, and I have been daily hoping to see some manifestation of it from the board. It certainly does not look well for the directors, or any one of them, to keep most valuable intelligence locked up in the waistcoat pocket, as it smacks of private use, even for one day.

FAIR PLAY.

For remainder of Original Correspondence see this day's Supplement.

### THE WEEK.

SATURDAY, Oct. 27.—There was a remarkable spurt in Carn Brea shares; a day or two ago the price was 35 to 40. To-day there were eager buyers at 46, the price closing 46 to 45. It is worth bearing in mind that at the commencement of the present month, although there had then been an advance in the tin standard, Flagstaff shares could be got at 22. We are, therefore, witness of an advance of more than cent. per cent. Had this occurred in a foreign loan or railway stock it would have been much made by City editors. As it was, there have been greater rises during the month in Cornish mining shares. Eberhardt, Flagstaff, and Frontino were all in demand, each advancing 5s.; this was making up day, always felt as an inconvenience when falling on such a short day.

MONDAY.—Metropolitan District touched 59; North British was neglected 91 $\frac{1}{2}$ . There were no other changes in the railway market calling for notice. In view of to-morrow's meeting (when it is usual to place matters in the most favourable light) of Grand Trunk shareholders, there was some demand for the stock. The First advanced 1 $\frac{1}{2}$ , to 47, the Second closed at 30 $\frac{1}{2}$ , and the Third at 17 $\frac{1}{2}$ . The ordinary shares were quoted 9 to 9 $\frac{1}{2}$ ; as far as regards these the prospects are dismal enough, the various leased lines absorbing all the profits. Carn Brea maintained Saturday's rise, closing 46 to 48. Three weeks at 17, and Roman Gravels offered at 7 $\frac{1}{2}$ . North Laxey, 10s. 6d.; Port Mountain, 9s. to 11s.; West Wye Valley, 3 to 3 $\frac{1}{2}$ ; Llanrwst, 2 $\frac{1}{2}$  to 3; Port Philp in demand at 10s., and Eberhardt at 5 $\frac{1}{2}$ . Condes de Chilli and Argentaria, 1s., and quotations nominal.

TUESDAY.—The Grand Trunk meeting passed off in the usual cheerful and hopeful manner, notwithstanding which a few holders of First Preference thought it would be well to sell, causing yesterday's rise to be quite lost. Wheal Bassett shares were quoted with a rise of 4 $\frac{1}{2}$ . At the com-mencement of the month these shares were said to have been about 10s. in the local markets; now quoted 12 $\frac{1}{2}$  to 15. It was in August of last year that the last dividend (10s. per share) was declared here. There had then been called up 12s., 2s., 8s. per share, at 63s. 6d., returned in dividends. Port Phillip was in demand at 12s., 6d.; the return made up to Oct. 10 is reported to be the largest received for years. The recent report of silver made by the Eberhardt Company is stimulating purchasers. There was a rise of 10s. to-day, and shares were firm at 5 $\frac{1}{2}$  to 6. Richmond was down in 7 $\frac{1}{2}$ . There was an advance of 30s. in Carn Brea, to 47 $\frac{1}{2}$ . It has been noticed at Lovell, Wheal Jane, Wheal Kitty, Medlyn Moor, and West Godolphin, so far, been hardly affected by the spurt in Cornish mining; perhaps the turn has to come.

WEDNESDAY.—Railways were dull from the commencement. Caledonian to 124, and Great Western to 101. Mining shares were again in considerable demand, and several further important advances were established. Richmond was up to 8, and Eberhardt to 7, being a rise of 1 $\frac{1}{2}$  in each case. Flagstaff improved 2 $\frac{1}{2}$ . The Mexican Railway are advised that \$42,000 have been shipped from Victoria to pay expenses here, and that the traffic earnings for September amount to \$21,000. The shares now quoted 1 $\frac{1}{2}$  to 1 $\frac{1}{2}$  may improve. Royal Sardine 2 $\frac{1}{2}$  to 3 $\frac{1}{2}$ . Obligations, ditto, 1 $\frac{1}{2}$  to 2. All these are at present very low.

THURSDAY.—Holiday on Stock Exchange.

FRIDAY (Opening).—Richmond fully maintains the strong rise of Wednesday. Shares can readily be sold at 8s., and with a little trouble at 8 $\frac{1}{2}$ . A further important advance has taken place in Eberhardt. Shares are in demand at 8. One further rise has been struck at a fresh point in the tunnel. Flagstaff are quoted 2 $\frac{1}{2}$  to 3 $\frac{1}{2}$ . In railways, Sheffield, 3 $\frac{1}{2}$  to 4; Cook's Kitchen, 2 $\frac{1}{2}$  to 3 $\frac{1}{2}$ . Lovell shares are now valued at 2 $\frac{1}{2}$ ; they were considered to be worth as many shillings a short time back. Two o'clock.—Eberhardt has been done at 8 $\frac{1}{2}$ , but are now easier at 7 $\frac{1}{2}$  to 8 $\frac{1}{2}$ . Richmond firm at 8 $\frac{1}{2}$ . Llanrwst, 2 $\frac{1}{2}$  to 3 $\frac{1}{2}$ . Van, 3 $\frac{1}{2}$  to 4. Ladywell, 7 $\frac{1}{2}$  to 12. Rookhope, 20s. to 22s. 6d. The rise in Sheffield has not only been completely lost, but the price (8 $\frac{1}{2}$  to 9 $\frac{1}{2}$ ) is lower than it was on Wednesday. Penistron, 5s. to 7s. Condes de Chilli, 2 $\frac{1}{2}$  to 3 $\frac{1}{2}$ . Lovell, 7 $\frac{1}{2}$  to 8 $\frac{1}{2}$ . Richmond is done at 8 $\frac{1}{2}$  to 9 $\frac{1}{2}$ . Aberdare, 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$ . Capanga, 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$ . West Godolphin, 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$ . Four o'clock.—Eberhardt has given way further to 8 $\frac{1}{2}$  to 9 $\frac{1}{2}$ . Richmond is done at 8 $\frac{1}{2}$  to 9 $\frac{1}{2}$ . Chapelle House, 2 $\frac{1}{2}$  to 3. Alatni, 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$ . Newport Abercarn, 3 $\frac{1}{2}$  to 4. Great Western, 2 $\frac{1}{2}</$

NOV. 3, 1877.]

## THE MINING JOURNAL.

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removal of the kegs by an automatic arrangement attached to the descending when empty could, of course, be readily effected.

## THE COPPER TRADE.

	Tons.
Chili & regulus, Liverpool & Swansea (equal to fine)	3,849
Chili bars in Liverpool	12,544
ditto	2,071
Swansea	10
Chili ingots in Liverpool	—
ditto	4,523
Swansea	58
Foreign copper (chiefly Australian) in London	58
ditto	60
English copper in London	7,991
Chili bars and ingots and Barlings in Havre	460 = 32,048
Other copper in Havre	—
Afloat and chartered from Chili to Europe (advised by mail):—	1,901
Ores and regulus (equal to fine):—	2,708 = 4,807
Barrels ingots	—
Afloat from Australia (advised by mail):—	1,600
Fine copper	—
Afloat and chartered from Chili to Europe (advised by cable):—	4,000
Total	Tons 42,253
Price of bars, 65/- 10s.; Wallaroo, 75/- 10s.; English tough, 70/-	

HENRY R. MERTON AND CO.

	Arrivals here during the fortnight of West Coast, S. A., produce
Bars, from Guayaquil, 833 tons bars; Quillota, from Valparaiso, 8 tons bars	
Chili & regulus, from Valparaiso, 813 tons bars, 150 tons	
Regulus, 200 tons bars; Galicia, from Valparaiso, 84 tons bars	
Barlings, 700 tons bars. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—	
Ores. Regulus. Bars. Ingots. Barlings.	
1223 2 84 12,544 10 —	
2154 4700 2,071 — —	
Liverpool	
Swansea	
Total	3977 6784 14,615 10 —
Price of 18,474 tons fine copper, against 17,908 tons Oct. 15; 14,619 tons	
Oct. 15, 1876; 12,435 tons Oct. 31, 1875; 12,703 tons Oct. 31, 1874. Stock of Chili	
copper in Havre, 798 tons fine, against 7950 tons Oct. 31, 1875; stock of Chili	
copper afloat and chartered for to date, 8500 tons fine, against 10,700 tons Oct. 31,	
1875; stock of foreign copper in London, chiefly Australian, 4523 tons fine, against	
850 tons Oct. 31, 1875.—Liverpool, Oct. 31. HARRINGTON, HORAN, AND CO.	

Copper was much neglected, and values lower. Charters from the West Coast for first half of October were advised as 1600 tons—1180 tons in ingots for Bars for England, and 450 tons for the Continent. Charters for second half of October, at 1800, are 2400 tons—1350 furnace stuff and 800 bars for United Kingdom, and 1250 bars to the Continent. Smelters have again been able to supply Ingots and 1250 bars to the Continent. The market is only met when a greatly increased value is obtainable. Tin has now risen from the lowest over 10 per cent., and as stocks are expected to decrease month by month, at all events till February, this advance will probably be maintained.—SPELTER: Speleter and zinc were both in better demand last month, but prices remained unchanged, and there seems but little hope, excepting from the chance of a severe winter, that the value of this metal will advance; the market on the Continent shows a better state of things, and, indeed, usually so, and it is a strange anomaly that a trade which certainly increases, as speleter does year by year in this country, should always be at the mercy of and, indeed, always in favour of buyers. There must be something radically wrong in the mode traders here deal in this metal.

Nov. 2. HENRY ROGERS, SONS, AND CO.

THE COPPER TRADE.

Imports. 1877. 1876. 1875.

Tons 82,104 55,508 40,570

Regulus 25,826 24,820 25,375

Copper 30,520 29,330 31,420

Exports. 10,631 12,774 11,196

English raw 7,786 8,711 8,188

Manufactured, including yellow metal and brass 21,300 17,330 18,999

French and Smith.

London, Nov. 1.

The statistical position of copper was practically unchanged during

the month. Prices received, however, from 20% to 40%, and with the exception of the

prices of ores and regulus and the transactions, especially in foreign copper, are very limited. A public sale of 795 tons of Wallaroo, and 200 tons Burra, is

arranged for Tuesday, Nov. 6. The prices of West Coast produce has for

the last month ruled higher in Chili than here; but latest advice show a drop on

Oct. 31, so that a purchase can at this moment be made to lay down here at 85%.

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## WATSON BROTHERS' MINING CIRCULAR.

Ten years ago the weekly information which had previously been published for a great number of years in WATSON BROTHERS' Mining Circular was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the Journal on the Clementina Mine.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

In the year 1848, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining" commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining" with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and share dealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

## WATSON BROTHERS,

MINEOWNERS, STOCK AND SHARE DEALERS, &c.,  
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

**THE COST-BOOK.**—Our remarks of last week were in answer to a "Shareholder" as to how far one partner had committed himself to certain accounts entered in a cost-book, when he had given his general proxy to another partner, with full power, of course, to sign his name to such accounts. In reply to other questions now sent us, we would remark that the safety-value of the cost-book is this—Any shareholder can retire and determine his loss by a formal notice of relinquishment sent to the purser, and by paying up his proportion of the debts of the company to the end of the month in which he relinquishes.

The best general treatise on the Cost-Book—and a most elaborate work it is—was written by Mr. Thomas Tapping, of the Inner Temple, barrister-at-law. His exhaustive treatise of the subject was first published in the *Mining Journal* of December 10, 1853, and in a distinct form by Messrs. Shaw, of Fetter-lane, in 1854. It was a prize essay in the first instance. "The best paper description of the Cost-Book, its principles, and practice," for a prize offered by Mr. Radwin through the Journal. The jurors appointed to examine the different essays, and award the prize (given to Mr. Tapping), were Sir R. P. Collier, M.P., Charles Hancock, J. H. Murchison, and J. Y. Watson.

Under the head of "raising money" Mr. Tapping says "a power to borrow must be expressly conferred by all the adventurers upon the purser, otherwise he cannot render the adventurers either singly or collectively liable to repay it to the creditor," although all the proceeds may have been spent upon the mine. This doctrine has been sanctioned by judicial determination, and it has been distinctly held that no purser has any implied power to obtain money on the credit of the adventurers. In the appendix to Mr. Tapping's work several legal cases in point are given. That of Ricketts v. Bennett is well known. The purser of Wheal Providence opened a banking account without the direction of the shareholders, and over drew it £618. In 1845 the purser ceased to act, and the bank brought an action against a shareholder (Bennett) to recover the money due. The judge directed the jury that the mere character of a co-adventurer did not confer authority to borrow money, so as to bind the other adventurers in a mine, and they gave a verdict for the defendant.

A new trial was then granted on the ground that the judge had misdirected the jury, and the verdict was against the evidence. The new trial came on before the Judges (Wilde, Mauls, and Creaswell) in 1874, and after hearing the most learned counsel of the day on both sides the verdict was confirmed. During the progress of the case many important points came out in reference to companies generally, and in the judgment delivered by Justice Wilde he referred to the case of "Hawtayne v. Bourne," where it had been held that the raising money by a director or agent when "found necessary in order to preserve the property of the principal" (such as the payment of wages on contracts entered into on behalf of the concern), and where the non-payment would stop the works, the law implied an authority to the agent to do it to "the extent of the necessity."

In the case "Ricketts v. Bennett," the purser of Wheal Providence had applied to the bank for an advance of money for the purpose, among other things, of making a dividend, which he "deemed expedient." The defendant, when sued by the bank, pleaded ignorance that the dividend had been paid from borrowed money, and that he had no knowledge even of the account at the bank until the balance due to it was demanded of him.

**THE RISE IN MINING STOCK.**—Although tin at present has only gone up about 8s. per ton, the reaction in shares has been something enormous. This we predicted some time ago, when we quoted the old rhyme to the effect that the public never touched things when they were low and de-preised, though it was the very time to buy in. When we wrote this the Cook's Kitchen were at 5s., and even lower, and are now at 2s. West Frances has risen from 5s. to 5s.; Carn Brea, 20s. to 48s.; Dolcoath, 20s. to 38s.; Bassett, 8s. to 15s.; South Cadurrow, 7s. to 9s. There are many others we could mention that have risen cent. per cent. within a few weeks, and by which those who had faith in the prospects for tin and bought up shares in the depressed times have realised very large profits. The question now is will tin keep up? In Cornwall the general opinion is that it will even advance much higher, and that in a few months we may obtain something like old prices again. We hope this idea will prove correct, and are rather disposed to think that it will, for stocks are rapidly diminishing, and at the present moment the smelters are giving 3s. beyond the standard price for ore. Having said this much of tin, we would call attention to lead and the low-priced lead mines, as some of them which we propose to name we have no doubt will in a few months have as rapid a rise as the tin shares have had already. There is always a fair demand for lead and the silver it contains, and during the winter months the stocks of lead on hand are likely to be exhausted in replenishing the material of war, so that we shall look for a good rise, equal at least to the fall that has taken place during the past few months from the general stagnation in trade.

**SATURDAY, OCT. 27.**—Tin shares in great demand at an advance. Van, West Wye Valley, Parys Mountain, and Leadhills also in demand. Carn Brea, 4s. to 48s.; Dolcoath, 20s. to 38s.; Tincoff, 18 to 18s.; South Cadurrow, 8s. to 9s.; Grenville, 3s. to 3s.; Van, 32s. to 35s.; West Wye Valley, 3 to 3s.; Parys Mountain, 10s. to 12s. 6d.; Leadhills, 5 to 5s.; North Laxey, 11s. to 13s.; Rookhope Lead, 20s. to 22s. 6d.; Roman Gravels, 7s. to 8s.; Tankerville, 4s. to 5s.; West Tolgois, 20s. to 22s. 6d.; South Cadurrow, 9 to 9s.; South Frances, 2s. to 2s.; Tankerville, 4s. to 5s.; West Tolgois, 6s. to 7s.; Agar, 4 to 4s.; Grenville, 3s. to 3s.; Pever, 5 to 5s.

**MONDAY, OCT. 29.**—Market rather weak, the dealers being chiefly engaged with the settlement. Carn Brea, 4s. to 48s.; Dolcoath, 20s. to 38s.; East Van, 3 to 3s.; Tincoff, 18 to 18s.; South Cadurrow, 8s. to 9s.; Grenville, 3s. to 3s.; Van, 32s. to 35s.; West Wye Valley, 3 to 3s.; Parys Mountain, 11s. to 13s.; Roman Gravels, 7s. to 8s.; Rookhope Lead, 20s. to 22s. 6d.; South Cadurrow, 8s. to 9s.; South Frances, 2s. to 2s.; Tankerville, 4s. to 5s.; West Tolgois, 18 to 18s.; Van, 32s. to 35s.; West Chiverton, 13 to 14s.; West Tolgois, 7s. to 8s.; Agar, 4 to 4s.; Grenville, 3s. to 3s.; Pever, 5 to 5s.

**TUESDAY, OCT. 30.**—Market very active for tin shares at advanced prices. Carn Brea, 47s. to 50s.; Dolcoath, 37 to 39s.; South Frances, 2s. to 3s.; Tincoff, 18 to 18s.; Pever, 5s. to 6s.; Grenville, 3 to 3s.; Agar, 4 to 4s.; Ladywell, 17s. 6d. to 22s. 6d.; Rookhope Lead, 20s. to 22s. 6d.; Van, 32 to 34s.; West Wye Valley, 3 to 3s.; Wye Valley, 2s. to 3s.; Grogwinion, 3 to 3s.; West Tolgois, 7s. to 7s.; ex div.; Tankerville, 4s. to 5s.; Roman Gravels, 7s. to 8s.; Great Laxey, 20s. to 21s.; Parys Mountain, 11s. to 13s.; Eberhardt, 5 to 5s.; Richmond, 6s. to 7s.; Jayval, 6s. to 8s.; Froncino, 2s. to 3s.; Pever, 5s. to 6s.; Parys Mountain, 10s. to 12s. 6d.; North Laxey, 3s. to 4s.; Rookhope Lead, 20s. to 22s. 6d.; Van, 32 to 34s.; Richmond, 7s. to 7s.; Eberhardt, 5s. to 6s.

**WEDNESDAY, OCT. 31.**—Market again active for tin shares, and a further rise has taken place. Carn Brea, 48 to 50s.; Dolcoath, 38 to 40s.; South Cadurrow, 9 to 9s.; South Frances, 2s. to 3s.; Tincoff, 18 to 18s.; Agar, 4 to 4s.; Grenville, 3s. to 3s.; Pever, 5s. to 6s.; Parys Mountain, 10s. to 12s. 6d.; North Laxey, 3s. to 4s.; Rookhope Lead, 20s. to 22s. 6d.; Van, 32 to 34s.; Richmond, 7s. to 7s.; Eberhardt, 5s. to 6s.

**THURSDAY, NOV. 1.**—Market closed.

**FRIDAY, NOV. 2.**—Market for the shares steady. Richmond and Eberhardt in demand at advanced prices. Carn Brea, 48 to 50s.; Dolcoath, 38 to 40s.; Tincoff, 17 to 18s.; South Cadurrow, 9 to 9s.; Great Laxey, 21 to 21s.; Van, 32 to 34s.; South Roman Gravels, 10s. to 15s.; Glenroy Lead, 15s. to 20s.; Rookhope Lead, 20s. to 22s. 6d.; West Tolgois, 6s. to 7s.; Parys Mountain, 10s. to 12s. 6d.; North Laxey, 3s. to 4s.; Rookhope Lead, 20s. to 22s. 6d.; Van, 32 to 34s.; Richmond, 7s. to 7s.; Eberhardt, 5s. to 6s.

**SATURDAY, NOV. 3.**—Market again active.

**SUNDAY, NOV. 4.**—Market again active for tin shares, and a further rise has taken place. Carn Brea, 48 to 50s.; Dolcoath, 38 to 40s.; South Cadurrow, 9 to 9s.; South Frances, 2s. to 3s.; Tincoff, 18 to 18s.; Agar, 4 to 4s.; Grenville, 3s. to 3s.; Pever, 5s. to 6s.; Parys Mountain, 10s. to 12s. 6d.; North Laxey, 3s. to 4s.; Rookhope Lead, 20s. to 22s. 6d.; Van, 32 to 34s.; Richmond, 7s. to 7s.; Eberhardt, 5s. to 6s.

**MONDAY, NOV. 5.**—Market again active.

**TUESDAY, NOV. 6.**—Market again active.

**WEDNESDAY, NOV. 7.**—Market again active.

**THURSDAY, NOV. 8.**—Market again active.

**FRIDAY, NOV. 9.**—Market again active.

**SATURDAY, NOV. 10.**—Market again active.

**SUNDAY, NOV. 11.**—Market again active.

**MONDAY, NOV. 12.**—Market again active.

**TUESDAY, NOV. 13.**—Market again active.

**WEDNESDAY, NOV. 14.**—Market again active.

**THURSDAY, NOV. 15.**—Market again active.

**FRIDAY, NOV. 16.**—Market again active.

**SATURDAY, NOV. 17.**—Market again active.

**SUNDAY, NOV. 18.**—Market again active.

**MONDAY, NOV. 19.**—Market again active.

**TUESDAY, NOV. 20.**—Market again active.

**WEDNESDAY, NOV. 21.**—Market again active.

**THURSDAY, NOV. 22.**—Market again active.

**FRIDAY, NOV. 23.**—Market again active.

**SATURDAY, NOV. 24.**—Market again active.

**SUNDAY, NOV. 25.**—Market again active.

**MONDAY, NOV. 26.**—Market again active.

**TUESDAY, NOV. 27.**—Market again active.

**WEDNESDAY, NOV. 28.**—Market again active.

**THURSDAY, NOV. 29.**—Market again active.

**FRIDAY, NOV. 30.**—Market again active.

**SATURDAY, NOV. 31.**—Market again active.

**SUNDAY, NOV. 1.**—Market again active.

**MONDAY, NOV. 2.**—Market again active.

**TUESDAY, NOV. 3.**—Market again active.

**WEDNESDAY, NOV. 4.**—Market again active.

**THURSDAY, NOV. 5.**—Market again active.

**FRIDAY, NOV. 6.**—Market again active.

**SATURDAY, NOV. 7.**—Market again active.

**SUNDAY, NOV. 8.**—Market again active.

**MONDAY, NOV. 9.**—Market again active.

**TUESDAY, NOV. 10.**—Market again active.

**WEDNESDAY, NOV. 11.**—Market again active.

**THURSDAY, NOV. 12.**—Market again active.

**FRIDAY, NOV. 13.**—Market again active.

**SATURDAY, NOV. 14.**—Market again active.

**SUNDAY, NOV. 15.**—Market again active.

**MONDAY, NOV. 16.**—Market again active.

**TUESDAY, NOV. 17.**—Market again active.

**WEDNESDAY, NOV. 18.**—Market again active.

**THURSDAY, NOV. 19.**—Market again active.

**FRIDAY, NOV. 20.**—Market again active.

**SATURDAY, NOV. 21.**—Market again active.

**SUNDAY, NOV. 22.**—Market again active.

**MONDAY, NOV. 23.**—Market again active.

**TUESDAY, NOV. 24.**—Market again active.

**WEDNESDAY, NOV. 25.**—Market again active.

**THURSDAY, NOV. 26.**—Market again active.

**FRIDAY, NOV. 27.**—Market again active.

**SATURDAY, NOV. 28.**—Market again active.

**SUNDAY, NOV. 29.**—Market again active.

**MONDAY, NOV. 30.**—Market again active.

**TUESDAY, NOV. 31.**—Market again active.

**WEDNESDAY, NOV. 1.**—Market again active.

**THURSDAY, NOV. 2.**—Market again active.

**FRIDAY, NOV. 3.**—Market again active.

**SATURDAY, NOV. 4.**—Market again active.

**SUNDAY, NOV. 5.**—Market again active.

**MONDAY, NOV. 6.**—Market again active.

**TUESDAY, NOV. 7.**—Market again active.

**WEDNESDAY, NOV. 8.**—Market again active.

**THURSDAY, NOV. 9.**—Market again active.

**FRIDAY, NOV. 10.**—Market again active.

**SATURDAY, NOV. 11.**—Market again active.

**SUNDAY, NOV. 12.**—Market again active.

**MONDAY, NOV. 13.**—Market again active.

**TUESDAY, NOV. 14.**—Market again active.

**WEDNESDAY, NOV. 15.**—Market again active.

**THURSDAY, NOV. 16.**—Market again active.



## TO THE METAL TRADE.

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## The Mining Market: Prices of Metals, Ores, &amp;c.

METAL MARKET—LONDON, NOV. 2, 1877.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, G.M.B., f.o.b., Clyde.	2 12 0	—	English, ingot, f.o.b.	75 0 0	—
Scotch, all No. 1	2 14 0	3 10 0	bars	76 0 0	—
Scotch, Welsh, f.o.b., Wales	5 5 0	5 10 0	refined	77 0 0	—
" in London	5 17 6	6 0 0	Australian	69 10 0	70 0 0
" Bradford	7 0 0	8 0 0	Ranca	71 0 0	72 0 0
" in Tyne or Tees	5 10 0	5 15 0	Straits	70 0 0	—
" Swedish, London	2 8 0	9 12 6	COPPER.		
Balls, Welsh, at works	5 0 0	5 2 6	Tough cake and ingot	70 0 0	71 0 0
Railway chairs	—	—	Best selected	71 0 0	73 0 0
" spikes	—	—	Sheets and sheathing	75 0 0	—
Sheets, Staff., in London	8 15 0	9 0 0	Fiat Bottom	79 0 0	—
Plates, ship, in London	7 0 0	7 5 0	Wallaroo	76 0 0	76 10 0
Hoops, Staff., in London	7 10 0	8 0 0	Burra, or P.C.C.	74 0 0	—
Mail rods, Staff., in Lon.	7 0 0	—	Other brands	72 0 0	—
STEEL.			Chili bars, g.o.b., nom.	64 10 0	65 0 0
English, spring	16 0	20 0 0	PHOSPHOR BRONZE.		
" cast	35 0	45 0 0	Bearing metal	£112 0 0	0
Swedish, keg	16 0	0 0	Other alloys	£120 0 0	140 0 0
" fag. ham.	17 0	0 0	LEAD.		
WIRE.			Wire	8d.	—
English, pig, common	20 0	20 0 2	Tubes	10	—
" L.B., nom. 20	5 0	—	Sheets	9	—
" W.B., 20 0 0	—		sheet and bar	21 0 0	5 0
" pipe	21 10 0	—	red	22 5	0 22 10 0
" white	27 5	0 28 0 0	white	24 10 0	—
Spanish	19 12 6	19 15 0	patent shot	24 10 0	—
QUICKSILVER.			BLACK.		
Flasks of 75 lbs., ware.	7 10 0	—	1st quality	10 0 0	1 10 0
SPELTER.			2nd quality	9 19 6	1 0 0
Silesian or Rhenish	19 5 0 19 7 6	—	Coke	10 0 0	—
English, Swanso.	31 0 0	—	Black	10 0 0	16 10 0
Shee zinc	22 10 0 24 0 0	—	Black Taggers, 450 of	30 0 0	—

\* At the works, £s. to £s. 6d. per box less for ordinary; £s. per ton less for Canada; £s. 6s. per box more than £s. quoted above, and add £s. for each X. Xe-plate 2s. per box below tin-plates of similar brands.

**REMARKS.**—The disposition to act cautiously is still noticeable amongst *bond fide* buyers; and, considering the very critical state of affairs generally, it is unquestionably the most advisable and commendable course to adopt, and we trust that it will exercise a salutary and governing influence over our markets, and in due time meet with a just and bounteous reward. Buyers cannot be too careful at a time like the present, when politics at any moment might suddenly take a very alarming turn, such, for instance, as an important success of the Russians over the Turks, which might endanger the peace of this country, for we already knew that the approach of the Russians to Constantinople would be the signal for action on the part of England. Therefore, while we continue on the brink of war it would be indeed very unsafe, we might almost say madness, to launch out into any immediate transactions of a speculative character, or even to extend ordinary business beyond the bounds of discretion. It is true that the feeling of alarm occasioned by the dispatch of our fleet to Besika and our troops to Malta has subsided, nevertheless the dangers that threatened us, and caused these protective measures to be taken, still remain, but are to some extent overlooked through the receipt of more recent and exciting intelligence from the seat of war, and public attention being drawn more to the French elections. The position of affairs, however, is unaltered, and if we should hereafter be involved in war other nations may follow, and a general European conflagration ensue, and no doubt the best thing that could happen for Russia, as well as for all other nations, would be that she was thoroughly defeated, and obliged to sue for peace. We are persuaded that nothing permanent or substantial can be established until the war has ceased, and the vexed question definitely disposed of. Yet this does not altogether seem to be the prevailing opinion in our market; so far as regards legitimate buyers it is so, but there exists a little clique who are apparently of a different way of thinking, and who are striving to uphold and carry on a speculative movement in tin, which we fear will have a prejudicial effect, and tend very much to unsettle the market. Nothing is more calculated to injure trade than an unnatural and ill-timed rise, but speculators seldom have much regard for consequences of that kind; they have but one object to serve—that is their own aggrandisement, and to enrich themselves, even though it be at the expense and annihilation of others. But speculation just now is particularly unfortunate, for it places the regular trader in a temporary difficulty, and he scarcely knows how to act, as ordinary business is slow and limited, and on that account he cannot afford any extra outlay; and yet, on the other hand, if he abstains from purchasing he may be placed at a disadvantage hereafter by being subject to higher rates, and, perhaps, thereby prevented from securing business that would otherwise prove very acceptable.

It is an established maxim, however, that of two evils always choose the least; and, as little is to be gained by buying in excess of actual requirements, certainly nothing commensurate with the risk, it would be better almost to withdraw, and give the market up for a little while to the little cliques, and let them reap the full benefit of their exploit out of one another. The point which emboldened them to act has been greatly magnified, and when properly viewed dwindles into microscopic dimensions, and they will probably find, to their cost and confusion, that as soon as ever their motion ceases all power of attraction will vanish, and the strong and vigorous impulse rapidly become weak and futile. We should, therefore, recommend buyers to wait, but if that course is inconvenient they ought to thoroughly examine into the whole character and influence of the market, and all its surroundings, before committing themselves to any important purchase at the enhanced rates; and not only contemplate present tendencies, but calmly ponder upon future probabilities, especially these three or four weighty matters, which cannot fail to act as a serious drawback to any advance; and they are, first, the diminution and continued slackness of trade; secondly, the Russian war and the complications that may eventually arise with this country; and, thirdly, the enormous stocks of tin and the large realisations that will be constantly taking place if the price improve; and this is not all, for an improved value will naturally stimulate production, expedite shipments, and lessen consumption. The great necessity for reduced prices is generally understood and admitted; and trade has long been in much too delicate a state to bear violent fluctuations arising purely from speculative transactions. We must first of all see the clouds and mists in the political horizon dispelled before anything reliable can be effected, and a potent stimulus of unfailing efficacy administered to shake off the present dull and inert feeling which pervades our markets; but there is no appearance of any approach of relief, and we have no alternative, therefore, but to accommodate ourselves to circumstances, and patiently abide coming events. It may, perhaps, seem a bold assertion to make, in face of the efforts that are being put forth to work up the price of tin, that we do not believe in the stability of the market, but we see no justification for the rise, and consequently do not hesitate to condemn it. We do not deny that the market is statistically a shade stronger, but it is so very trifling yet that the change does not warrant more than the arrest of the downward tendency, and perhaps a slight improvement in rates; but the advance, in our opinion, is universally extravagant.

Speculators will not be able to draw in manufacturers or shippers, and we doubt whether the public will be induced to take part in it, so the select few are likely to have the whole advantages to themselves. The manufacturer has to consider the condition of the consumer, and to ascertain what prospect there is of a general improvement, and the merchant has to look to the chances of a return from abroad. Now, as neither the trading or working classes, who really constitute the bulk of the population, are in a flourishing condition, it seems very improbable that a speculative rise, unsupported by any positive, decided, and material increase in the demand, or falling off of supplies, can be attended with ultimate success. It is one thing to maintain a temporary position upon superficial grounds, but quite a different matter to turn it to profitable account. There is a saying that any fool can buy, but it takes a wise man to sell; this not only applies to the ability to sell but also to know the right time to sell. Well, then, the question to decide is simply this, and it is a very simple one. Is this a favourable time for speculation? Because, if it is, go on, manifest your confidence in the market; if not, drop it at once, and cease to continue the irritation. We are sure that we have the rational and impartial part of the community with us in stating that a period of war, famine, and stagnation of trade is, above all others, the very worst time that could be selected for speculation.

**COPPER.**—The events of the week have in every respect minutely confirmed the statements contained in our report of last week, and the result is a partial collapse of the market—in fact, there has scarcely been any market at all, for to effect sales of any extent sellers would have had to submit to considerably lower rates. The deliveries of Chili for the last fortnight are about 17,000 tons, and the stock in Liverpool and Swanso. has increased to 18,474 tons, against 17,993 tons on Oct. 15; and the charters from Chili for the second half of October are telegraphed as 2400 tons—500 tons bars and ingots, 1350 tons of furnace stuff for United Kingdom, and 250 tons bars for the Continent, and the price is again reported slightly lower in Valparaiso. The price of bars is now in a fair way of being reduced to the figure that they ought to have stood at some time back, and the delay has immensely restricted business. Holders are generally so very reluctant to make concessions until necessity compels that they are more often greater losers than they would otherwise be, and importers seem strongly impressed with the idea that because they gave more for their copper than they can realise that is sufficient reason for not selling. Now, how absurd is this, and yet how many lose their money by attempting to follow out this sophistry. The principal importers from time to time have all committed the same blunder, and the sacrifice has in consequence been enormous. It is perfectly ridiculous to imagine that importers of copper, more than any other people, are to be exempt from losses, and if they acted a sensible part they would always take the first loss, and sell within a reasonable time after arrival, and not keep up stocks to the detriment and depreciation of the whole market. If every importation of copper were to be sold at a profit the number of importers would vastly increase in a very short time, but as copper is subject to fluctuations, like all other produce, sellers need not be surprised if they find their copper occasionally arriving in a bad and falling market. Our boldness

in pointing out the errors of importers may not be altogether appreciated, but we have no idea of misleading others by purposely withholding what ought to be plainly stated, or by misrepresenting facts. What if we had assured importers for months past that their position was perfectly safe, and that they had nothing to fear from lower prices, and that the demand would be fully equal to the supply, instead of plainly telling them, as we have done, that they occupied a false and dangerous position, and that the sooner they sold the better it would be for them.

No holder of copper can say that he has been lulled into fancied security by our reports, and no doubt there are many who wish that they had taken our advice and sold before. We heartily wish they had, for it would have been better for all parties; but would they still hesitate on account of the loss having been increased? If so we again warn them lest that increased loss is further added to, for what better price can they expect when next week 1000 tons of Australian copper will be forced on the market for sale? The Wallaroo sale of 795 tons of caked and ingots is advertised for the 6th inst, and this will be followed by a sale of 200 tons of Burra cake and ingots. Wallaroo has already dropped from 80/- to 75/- 10s., but Burra has scarcely undergone any change, and what little remains in second hands is extremely well held, and the Australian Company have not lowered their price below 74/-, which, however, is normal. In manufactured by 4 sheets sales are reported as low as 74/- 10s., but as this price is not general, and we have not heard it confirmed, it must be received with the usual caution. However, it is a price that we appear to be fast approaching, and we should not be surprised if the rumour turned out correct. Second-hand lots of tough are reported to be sold at 82/- 10s. The aggregate quantity of Chilean and Australian copper in Europe, afloat, advised by mail, and chartered, amount to 42,253 tons, against 40,523 tons on Oct. 1. By the mail from New York on Oct. 20 the market for ingots was stated to remain in the same quiet position, buyers purchasing only as their immediate necessities dictate, prices being without quotable change, sales having been effected from 17½ cents to 18 cents. Our market to-day is extremely shaky. G.o.b.'s are at 64/- 10s., up to 65/-, with prompt three months.

**IRON.**—There has been rather more doing in merchant iron, and some sellers having booked sufficiently of Welsh bars, and are declining to sell at previous rates, and now ask 2s. 6d. to 5s. per ton extra—viz., 5/- 17s. 6d. to 6/- 10s. The change, however, as yet is unimportant, and it is doubtful whether the improvement will continue for more than a short time. Sellers are too eager, and jump at conclusions, and think because a few extra orders are placed that an immediate increase in the demand is going to take place. This, we fear, is a mistake, for nothing of the sort is likely to occur, neither can it be expected while the peace of Europe is disturbed; but there will doubtless be periods of greater activity than hitherto experienced, and the works will probably benefit by them. The present enhanced quotation is a confirmation of what we have previously stated, that the works will be ready to avail themselves of any favourable opportunity to enforce higher rates. The wisdom of such a proceeding we are inclined to question, and we would rather see the foreign houses first move ahead of us, even to the same difference as they have for a long time past been below us; we should then have a good chance of recovering some of our lost buyers, who have been driven away from this market solely on account of the prevalence of dear prices.

The present prices, however, are moderately cheap, and there is no cause for complaint on that score, and those buyers who are able to stock cannot suffer much by beginning to replenish their stores. We do not say that the minimum of the market has been reached, and that it is time to accumulate stock, but only that dealers should be well provided, and rather add to stocks than allow them to diminish, and it is a particularly favourable opportunity for all public companies to execute repairs and complete alterations, for the iron can now be obtained quickly, and at moderate prices. Wherever iron is used and likely to be wanted the present occasion is extremely favourable for securing requirements. A further reduction upon present prices cannot be of any material importance, and it is never worth while to hold out an immoderate length of time, as many have occasionally done, and missed their market altogether. There may not be much of anything to be made out of iron yet awhile, and it may, therefore, not prove to the interest of dealers to buy overmuch, but foundries and smithies certainly might be kept well supplied. Dealers can watch the little turns in the market narrowly, whereas workers have less opportunity. Any important advance in iron will not take place until peace is secured, but it will not do for regular consumers to wait for that announcement, and we should now advise steady buying for keeping up assortments. The stock of Scotch pigs in store is 185,087 tons, being an increase of 4085 tons, with warrants in circulation for 143,500 tons.

## SHIPMENTS.

Week ending Oct. 28, 1877	Tons 13,580
Week ending Oct. 27, 1877	8,610
Decrease	4,940
Total decrease for 1877	7,542
Imports of Middlesborough pig-iron into Grangemouth:—	
Week ending Oct. 27, 1877	6,828
Week ending Oct. 28, 1877	4,819
Increase	2,209
Total increase for 1877	61,931

## FURNACES.

In blast Oct. 21, 1877	118
In blast Oct. 20, 1877	89

**TIN.**—This market is really attaining an enviable notoriety, for whilst others are dull and gloomy, tin is moving along gaily and briskly. Holders may well congratulate themselves that they have at last succeeded in finding buyers who are willing to relieve them of their burdens and give them an advanced price in exchange for their tin. A good many sales are reported at improving prices, and sellers say that during this month and next the market is to be very much better. The arrivals are to be small, and we are promised a great reduction in stocks by the end of the month, and very small shipments are to be made; so that come the end of December statistics will have undergone an extraordinary metamorphosis. What a surprising change is this all at once. From a downward market to an upward market. From heavy stocks to reduced stocks. From large shipments to small shipments. From a limited demand to an excessive demand—all most happily combined in a moment of time to dazzle the sight and to elevate the spirits; to afford excitement and drive away care, and fill the pockets of speculators, and to empty those of consumers. Sellers, of course, have made due allowances, and have taken into consideration the effect which such a wonderful change would naturally produce. The probabilities of tin coming forward and of tin coming out upon the excess delivery—yes, everything provided against. Nothing overlooked. The time (by sellers' indicator) is now on the strike for a rise, and the Cornishman may now safely go on investing his little all in his pet metal, and he will probably relish his bowl of hohe none the less if the price should advance so high as to prevent that selfish little piece of extravagance and anticipated luxury being realised of having his tea delivered in brilliantly polished tin-lined chests. Instead of that nasty poisonous stuff which the barbarous and pig-headed Chinaman cling to as pertinaciously as he does and ever will to L. B. The stock of foreign tin in London and Holland, afloat and afloat and advised by mail and wire, amounted to 15,897 tons on Oct. 1, and was reduced on Nov. 1 to 15,405 tons, being a difference of 492 tons; the actual stock, however, in London on Oct. 1 amounted to 9271 tons, and on Nov. 1 9233 tons, showing a diminution of 8 tons.

**LEAD.**—Quiet, but slightly drooping. The Cornish rumour of the substitution of tin for lead in the China and Indian tea-chests may have had something to do with it, buyers not unlikely being frightened off by the startling announcement. The favourite L.B. brand for their markets is not yet seriously indisposed.

**QUICKSILVER.**—While California advised no change this week, the demand on this side has been poor, inducing importers to reduce their price to 7s. 10s., and latterly to 7s. 7s. 6d., at which more enquiry has sprung up at the close.

**THE IRON TRADE**—(Griffiths's Weekly Report).—Friday Evening. We have no change to report in G.M.B. Scotch pig-iron, the price on the Glasgow Exchange this afternoon at the close of the market is 52s., about 1½d. per ton below the closing price last week. We quote makers' No. 1: Gartsherrie, 60s.; Coltness, 65s.; Calder, 61s.; Langloan, 62s. 6d.; Summerlee, 59s. 6d.; Monkland, 54s.; Glengarnock, 59s. f.o.b. Glengarnock; Shotts, 61s. 6d. f.o.b. Leith; Kinnel, 55s. 6d. f.o.b. Boness. There is really no change of importance in our markets this week in regard to prices. The part of the trade most buoyant over the last three months, and in which heavy quantities of metal are consumed, has been boat plates, angles, and bars, made at the works on the Tees. We regret to say that this trade has now dwindled into insignificance. There are no new orders coming out for boat-plates, and with regard to angles and common bars, we must confess that the Belgian houses are cutting out Middlesborough in prices, and are taking the whole of these orders. What is still more disheartening, the Belgian ironmasters, or the Belgian merchants, are consigning very large quantities of bars, angles, and nail-rods to China, India, Japan, and the Straits. This has so deranged the business of our own London merchants as to close their operations for these markets in common iron for the present. This state of things is of necessity taking seriously on our industrial friends on the Tees.

At the present price of Belgian iron the Tees works can no longer compete with them. The demand for Staffordshire sheet-iron of all kinds has been very poor, and prices weak, with a small business.

Boiler plates, of the Sneishill, Stannifield, and Moubray brands, are in moderate demand;

and the marked bars of B.B.H., Philip Williams and Sons, of Wednesbury Oak, the British Iron Company, John Bassall and Sons, E. T. Wright and Sons, and the Minerva are the sort just now required, and being bought by our engineers and the railway companies. All these buyers seem more disposed to stock these qualities just now. We have nothing to report in rails; these are unstable for both kinds.

Tin plates are weaker, and cokes are being pressed on the market at lower rates than ever. Pig-iron on West Coast is firmer, and worth more money all round.

The Middlesborough market is weaker, and if the Scotch ironmasters blow in more furnaces there is nothing for it but lower prices or blowing out furnaces on the Tees.

The market at Glasgow is giving way by small degrees; future course of prices, however, on this Exchange will depend upon the ironmasters' resolution to enter into a new arrangement in regard to the one which will soon cease by the effusion of time. The colliers' and miners' wages are now settled in the Black Country. Metals are about the same; copper is weaker; the late spurt in tin is maintained, and operators say there is an advance of 20s. this week in this metal.

**COPPER**—Messrs. RICHARDSON and Co.,



## NOTICES TO CORRESPONDENTS.

\*\* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be sent on receipt; it then forms an accumulating useful work of reference.

EXPLOSIVES.—"Mercator" (Grosvenor-square).—There does not appear to have been any book published treating of explosives generally; but an elaborate paper containing much information on the subject was read before the Society of Engineers by Mr. P. F. Nursey, the secretary, and appears in the Transactions of the Society. Mowbray's "Tri Nitroglycerine," published by Van Nostrand, of New York, contains much valuable matter concerning nitroglycerine compounds, and many small pamphlets have been published describing special explosives.

RAILWAY TUNNELS.—Standedge (London and North-Western) tunnel is the longest in England, being  $3\frac{1}{2}$  miles in length; Woodhead tunnel (Manchester, Sheffield, and Lincolnshire), 3 miles and 20 yards; Little Barrow (Lancashire and Yorkshire),  $2\frac{1}{2}$  miles. These are the three longest tunnels in England. Box tunnel is a little over 2 miles.

COPPER EXTRACTING PROCESSES.—"J. M." (West Bromwich).—No copies of Mr. Bensusan's lecture are obtainable in this country, except by order. Messrs. Trübner and Co., of Ludgate Hill, will, no doubt, furnish "J. M." with full information as to price, &c., if he writes to them.

SHARE DEALING.—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broker through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

Received.—"Shareholder" (Trebleigh Consols) had better write to the Purser. The letter of "A Victim" (Edinburgh) in the Central Swedish Iron and Steel Company is too personal for publication.—"W. G."—*"Sootus"* (Oct. 31)—"Be in Time" (Brighton)—"Constant Reader" (York)—"Shareholder" (Wheaton-Grenville).

THE MINING JOURNAL,  
Railway and Commercial Gazette.

LONDON, NOVEMBER 3, 1877.

## THE BLANTYRE COLLIERY EXPLOSION.

MR. MACDONALD, M.P.

Whilst mining engineers, Government Inspectors, and the rank and file of those connected with the colliery at Blantyre were busily engaged in the most praiseworthy efforts to clear the shaft and the workings, so as to recover the bodies of the poor fellows killed by the explosion, Mr. MACDONALD, M.P., true to his reputation, considered the time and the occasion suitable for delivering one of those fiery denunciations against colliery owners, managers, and everyone placed in power for the carrying on of ordinary mining operations. On the surface he was bold in speech, but discreet in action, for he does not appear to have descended the colliery himself, as a practical miner might have been expected to do, although many of the men were clamouring to be allowed to do so; but as an excuse for himself he stated that he deeply sympathised with the object of the men—the recovery of the bodies in the pit—but he had visited for the last 20 years all the great mining disasters, and he was, therefore, strongly of opinion that the miners should wait patiently, and not risk their lives in order to recover the dead. The advice we fully admit was well timed and good, but it also shows how careful Mr. MACDONALD is not to expose himself to the slightest danger, whilst at the same time taking credit for being a wise counsellor. In his address to the men in illustrating the necessity for a policy of caution he remarked that on the occasion of the Oaks Colliery explosion 20 men volunteered and descended for the purpose of recovering the dead bodies, and all of them perished for their bravery. But it cannot be said of Mr. MACDONALD that he at any of the great explosions ever volunteered to go down where there was any actual danger, such as at the Oaks, Lund Hill, Hartley, and many other places. Keeping aloof from the points of danger he has generally been found after the occurrence has taken place denouncing and threatening all persons who were in any way connected with the colliery where an explosion has led to a loss of life. In the case of the disaster at Blantyre he appears to have been more than usually rabid, virulent, and inconsistent, and displayed every quality but what might have been expected from a legislator, even of the very lowest capacity. Without waiting for the inquiry or the evidence of any person connected with the colliery, without consideration, and at a time when those he addressed were highly excited, he denounced in terms such as a maniac might have used when raised to a high pitch of frenzy every official connected with the colliery, the owners, and the Government Inspector of Mines. He said he spoke "advisedly that the grossest neglect had been manifested in the inspection of the mines in that district." What the neglect was he does not appear to have informed his hearers; in all probability because he was not acquainted with any. As Mr. MACDONALD, however, evidently alluded to some supposed *laches* on the part of the Government Inspectors of Mines for the district it is only right to state that it is no part of their duties to visit and examine the various collieries with which they are officially connected. To do so would take Mr. MOORE and his colleague all their time, for in the Eastern division of Scotland there are no less than 367 collieries. Inspectors have power to visit and examine all collieries to see that the provisions of the Act are carried out, with respect to the ventilation, and the safety of the persons employed in or about them, or in the event of their attention being called to any neglect on the part of the officials connected with a mine, it would be their duty to inquire into it.

In what way then Mr. MOORE, and his assistant, Mr. ROBSON, have been guilty of any dereliction of duty we are unable to discover, for no complaints so far have been made against them, excepting, indeed, what has been given in a wholesale manner by Mr. MACDONALD. But it is provided that in a mine in which inflammable gas has been found within the preceding 12 months, that part of the mine shall be inspected before the men commenced working by a properly appointed person. This, however, cannot, we should say, be the inspection to which the member for Stafford alluded. Waxing warm on such a congenial occasion, Mr. MACDONALD stated that there had been gross neglect, and that neglect would be proclaimed throughout the kingdom. Should such really be the case the public, without any aid from Mr. MACDONALD, will be made acquainted with it through the medium of the Press, the impartiality of which in accuracy is only equalled by the partiality of those who assume the right to speak in the name of the working miners of the kingdom, but who never work themselves, or volunteer for posts of danger in connection with colliery accidents, but leave such honours to their followers.

But least there should be the slightest misapprehension as to his views of such catastrophes as at Blantyre, Mr. MACDONALD expressed a hope that the country would not rest contented until every such disaster was declared to be murder, and that the authors of the crime should be tried for murder. A more monstrous and undefensible proposition could not be well conceived, and were it possible to carry it out we have no hesitation in saying that the probability is that some of Mr. MACDONALD's supporters would be the first to suffer, for we have not unfrequently to record cases where miners have been sent to prison for tampering with safety-lamps, lighting matches and smoking in mines in which gas was known to exist, and there is very little doubt that from such causes, and the use of gunpowder, most of the great colliery accidents have resulted. Unfortunately, however, in scarcely any one instance have our ablest men been able to trace the actual perpetration of an offence leading to an explosion to any person or persons, as in all probability they would be the first to lose their lives as the penalty for their neglect or thoughtlessness. But this is not the class of persons that Mr. MACDONALD would evidently like to see tried for murder, but the owners of collieries, who are so superior to himself in education, gentlemanly conduct, and social position, and these qualities are always sufficient to excite the envy as well as the hatred of the mean and paltry-minded.

But what all impartial persons will without hesitation condemn in Mr. MACDONALD's recent utterances is the recklessness with which he has brought forward the most serious charges against cer-

tain individuals, without any proof whatever of their guilt; and this he admits, for in his address he said—"Anyone who had evidence to give on the subject should communicate with him, and he would take means that it should be adduced at the investigation." This is quite gratuitous, for we know that evidence will be accepted, no matter from what quarter it is obtained. Anything more unfair, ungenerous, or calculated to prejudice certain individuals cannot well be conceived than condemning them before they are tried or charged with any offence, or before a title of evidence is adduced against them. Yet this is what has been done by one of our legislators with respect to the explosion at Blantyre; but there is one consolation for those who may feel aggrieved at the conduct of Mr. MACDONALD, which is that his extraordinary views on mining disasters are peculiar to himself, and are not shared in by any other member of the House of Commons. For our own part, we shall wait until the investigation to be carried out by Mr. DICKINSON is completed before we express our own views on the subject, and it is to be hoped that, as such will undoubtedly be the course pursued by the Press, private individuals in ordinary fairness will do the same. Mr. DICKINSON is the oldest Inspector of Mines that we have, has had great experience in such enquiries, and took a very active part in trying to unravel the mystery of the Oaks explosion, so that the greatest confidence may be placed in his ability to bring out all the evidence that can be obtained for tracing the cause of the explosion at Blantyre Colliery. Before concluding our remarks we cannot but express our regret that whilst Mr. MACDONALD has so long been the tutor of the Scotch miners he has not thought it worth his while to form a permanent relief fund association to meet such catastrophes as that which has recently taken place, so that provision might have been made for widows and orphans, without having to appeal to the public for their support. Such funds exist in the North of England, Yorkshire, and Derbyshire, and have been very successful, although the miners in those districts cannot boast of having a Member of Parliament for their chief.

## DIFFICULTIES IN JOINT-STOCK ENTERPRISE.

The progress of the JOHN COCKERILL COMPANY illustrates very forcibly the difficulties inherent at present in joint-stock enterprise in Europe. It appears that the purchases and sales concluded by the company in 1876-7 attained an aggregate of 1,178,106L, showing an augmentation of 17,055L as compared with 1875-6. No sensible augmentation is, however, anticipated under this head so long as an improvement is not witnessed in the present difficult conditions which industry has to sustain. The value of the production effected by the company in 1876-7 in the various divisions of its operations amounted to 1,317,573L, as compared with 1,422,909L in 1875-6, showing a falling off of 105,336L this year. The rough profits of the company in 1876-7 were, however, sensibly larger than in 1875-6, having amounted to 73,679L, as compared with 47,798L in 1875-6, showing an augmentation of more than 50 per cent. this year. With the exception of the calcining works, certain mineral bearings, and a shipbuilding yard organised by the company, all departments of its operations contributed to this *prima facie* favourable result. To the 73,679L just indicated may be added a balance of 10,382L brought forward from last year, making the total rough profits of 1876-7 84,061L. From this sum, however, the directors made a statutory deduction of 25,529L in respect of the renewal of tools and premises; secondly, 10,378L was deducted in respect of sundry interest; thirdly, 16,343L was written off for bad debts; fourthly, 80,074L was deducted for general expenses. These formidable deductions having been made, a balance of only 23,204L remained available for the payment of a dividend upon the share capital; this balance admitted of the distribution of 1L 8s. per share, and this amount is to be distributed Nov. 5. The item of 16,343L for bad debts was certainly a serious one. About half of it (9,492L) arose under the heading of a contract for iron bridges and pipes undertaken on Russian account. The importance of this contract was 84,000L, and the JOHN COCKERILL COMPANY engaged to transport the *material* to its destination, and to erect it there. A part of the *material* was not delivered unfortunately until navigation had closed in the Baltic; and it had accordingly to be carried across Russia in the midst of snow, and during weather of great severity generally. The transport of the *material* was attended, under such circumstances as these, with heavy expense, and a part of this expense had to be sustained by the company. To make matters worse, the parties for whom this contract was being executed in Russia fell into pecuniary difficulties, and became unable, in fact, to meet their engagements; they accordingly appealed to their creditors—and, *inter alios*, to the JOHN COCKERILL COMPANY, which was a creditor for 28,000L—to abandon a part of their claims in order to avoid bankruptcy. After a due examination of the circumstances, the Council of Administration came to the conclusion that some such arrangement as this was justified in the interest of the company. A loss of 306L was also sustained last year in transactions pending with a Belgian house; this firm was generally considered as perfectly sound, but, contrary to all anticipations, it was brought down through hazardous speculations undertaken by one of the partners.

The company profited sensibly last year by the severe economy brought to bear upon its operations. Thus a saving of 14,584L was effected under the head of general expenses. The still more important saving of 54,336L also took place under the head of wages paid to workpeople. This reduction was effected partly through a diminution in the number of persons employed by the company and partly through a lower scale of wages having been enforced.

## SEPARATING GOLD FROM CHILIAN COPPER.

At a recent meeting of the French Society of Political Economy an important communication was made by Mr. Andre Cuchut to the effect that by a discovery of an Alsatian—Mr. ALFRED PARAFF—the gold which has long been known to be contained in the Chilian copper can be extracted at a profit. The experiments made by the official assayers are said to be satisfactory in the highest degree. It appears, moreover, that Mr. Paraff has erected smelting works on a large scale, and he anticipates that in one year he will be rich enough to buy back Alsace and Lorraine from the Germans. It has frequently been stated upon the best authority that in Chili there are large masses of copper sulphurites which contain from 2L to 3L of gold, although in the absence of any reliable practical process of treatment the separation of it has never been made commercially remunerative. Now that such minerals should remain worthless, while in England refuse ore containing only sixpence worth of gold to the ton is treated with profit both at Widnes and elsewhere, it seems marvellous that the Chilian sulphurites should have been so long neglected.

In Chili Mr. Paraff recently announced that he was able and prepared to extract this gold at a profit, and, moreover, could get more out of the sulphurites than they assayed. He stated that he had an ingredient which, mixed with the ore in a certain way, would bring out not only the 3L per ton proved to be present by both humid and fire assay, but also from half-a-pound to a pound of gold beside to every 100 lbs. of copper sulphurites. This proportion rather took the Chilians, who, if the statement were verified, had more riches at their door than they ever dreamed of. Mr. Paraff proceeded to prove it. He gave some of them a portion of his peculiar powder, and told them to assay it. Result: no gold, no silver. But this powder could precipitate out of the mass of copper sulphurites the quantity of gold he stated. The powder is taken publicly and mixed with a lot of the sulphurites, and the whole reduced in a crucible. Result 35 lbs. of gold, pure virgin gold, which assayed at the Mint was found to be perfectly pure.

Opportunist, we have a communication from our old correspondent, Mr. Henry Sewell (who is now in the United States on mining business), enclosing extracts from articles from various newspapers, in which he enters very fully into the matters here referred to. Mr. Sewell discredits the success achieved by Mr. Paraff upon the principle that what has not been done cannot be done. Referring to the reception which the Chilians have given to Mr. Paraff, Mr. Sewell states that the success created a profound sensation.

Mining engineers, chemists, and those high in authority are averted to his belief. Now large and expensive works are erected in Santiago to work the copper sulphurites by this process. Paraff has sold to the Chilians alone stock in the company to the amount of 40,000L. All this has, in Mr. Sewell's opinion, been accomplished in a very shrewd manner. In the first place, the sulphurites contained some gold, as they all knew. They are first-rate things on which to operate. He alone possessed the secret of this wonderful powder, and he alone must manage the works. By working in a small way he turns out 35 lbs. of gold and other lots in smaller quantities. No large operations can be carried on without extensive works. Mr. Sewell denounces such a scheme, but this does not diminish the hold which Mr. Paraff has upon the people. Mr. Sewell entertains the opinion that the reason why he has been so successful is that those persons are themselves mining engineers who are there seem to have as much faith in Mr. Paraff as others. One of them has written to me in San Francisco, telling him not to denounce Mr. Paraff, as he is really doing wonderful things. "This from a mining engineer in Germany."

Mr. Sewell also considers that the statement in a Buenos Aires paper requires very much confirmation, but it is subjoined readers may judge for themselves. The newspaper in question states that a telegram from Valparaiso had just been received to effect that Messrs. Paraff and Co. handed the Government 150L of gold (worth about 7000L), being the product of the first working, and to-day begins the coining of the same into coins. Some of Paraff and Co. shares have been sold at the Mint. Some of Paraff and Co. shares have been sold at the Mint, some days as high as 16,000L each, or \$80,000. Mr. Paraff is a French chemist, who has invented a mode of extracting gold from copper which gave 2L tons of metal. A sample of this was taken to the Mint, and gave scarcely any gold; but when Paraff tried out his "reactive" process it yielded 35 per cent. pure gold. Hence the Government placed at his disposal a department of the Mint, where 150 lbs. of pure gold have now been turned out.

COAL AND IRON IN THE UNITED STATES.—The Pennsylvania trade is reported to be "considerably demoralised." The steel trade is reported to be "considerably demoralised." The aggregate production of anthracite and bituminous coal in Pennsylvania for this year amounted to 17,323,232 tons, as compared with 15,600,343 tons in the corresponding period of 1876, showing an increase of 1,720,889 tons this year. The market for steel rails at Philadelphia has been rather unsettled for the time being, with a prospect of considerable advance in prices; sales have been noted to the amount of about 15,000 tons, at about \$41 per ton at the mills. It is to be hoped that firms and companies are about to combine for higher prices in iron rails has been rather quiet, and but few transacts of importance have been noted. Sales have been almost entirely confined to small lots; one mill has secured sufficient orders in order to keep it employed for the remainder of the year. A considerable portion of the orders on hand relate to steel rails, which has been little new business in plates and tank iron, but with orders on hand, and the regular daily demand, the mills are fairly employed. At Pittsburg the general position of the iron trade has remained much the same; orders have continued to come in tolerably freely, but there are still complaints with regard to prices. There has been a fairly active trade in steel at Pittsburg, although the enquiry has been principally for lots; some few of the mills are using old rails for specialties.

GOLD MINING IN VICTORIA.—We have been favoured by Thomas Couchman, the secretary for mines, with the reports of Mining Surveyors and Registrars for the quarter ended June, which it appears that there were 38,916 miners employed, of 14,053 Europeans and 10,312 Chinese were engaged in alluvium and 14,427 Europeans and 121 Chinese in quartz mining. There were 261 steam-engines of 7136 horse power in the aggregate. The total value of the mining plant in use was 1,972,248L; the area of square miles of auriferous ground actually worked upon 1164, and there were 3305 distinct quartz reefs actually worked upon. The total quantities of gold obtained were 72,784 ozs. 6 dwt. from alluvium, and 128,234 ozs. 13 dwt. from quartz; together 201,068 ozs. 19 dwt. The 263,904 tons of crushed ore gave an average of 9 dwt. 18 grs. of gold per ton. The 6948 tons of quartz tailings and mullock yielded 2 dwt. 7 grs. of gold per ton, and the 1985 tons of pyrites and blanketing ore gave 1 oz. 13 dwt. 15 grs. per ton. From the separate it appears that there has been little if any revival from the season which has been so long felt.

PATENT BUSINESS OF THE WORLD.—The following abstracted from the official records, shows the remarkable increase in patent business in the principal countries of the world during the past 30 years. The figures first in order for each country, the patents granted in year 1846, and the second figures refer to year 1876:—Great Britain, 492, 3435; Canada, 38, 1212; Australia, 406 (in 1853), 1294; Baden, 9, 187; Bavaria, 112, 217; Bremen, 400, 2657; France, 2750, 5734; Italy, 224 (in 1853); Prussia, 55, 461; Saxony, 31, 483; Sweden and Norway, 3; United States of America, 619, 17,026; Wurtemberg, 8, 256. Patent business has been almost stationary during the 30 years. The official list in no case having been more than 103 patents. The total patents in the above countries for the years first quoted 5303, as against 33,938 in the year 1876. It may be explained, however, that the 33,938 patents do not represent an equal number of inventions, as many of the better class of inventions are patented in other countries simultaneously.

PETROLEUM.—In accordance with the decision of the Committee of the Petroleum Association, Mr. Boverton Redwood, F.R.S., a chemist and engineer of the association, will sail for New York by the steamer *Bothnia*. Mr. Redwood's visit has reference to the testing of the petroleum oil imported into this country—a which has for some time past been under investigation by Prof. Abel, C.B., F.R.S., chemist of the War Department, with a further legislation; the present legal method now adopted being found unsatisfactory.

BRICKMAKING.—The brickmaking season is now fully under way, and the whole is being very favourable one for most men. Owing to the number of new schools being erected parts of the kingdom, the result of recent legislation, and the causes, the demand has been unprecedentedly great, the net being that bricks have fetched a capital price. Then, the price has been exceptionally fine; the brick-moulders and the bricklayers have thus lost very little time, which, of course, makes a considerable difference in their earnings. Brick-moulders, set-temperers have earned on an average from 50s. to 60s. per week, and in some cases even more. In the large brickmaking districts, such as Sittingbourne and Faversham are the centres, over 200,000 of bricks have been turned out this season. Of these 60 millions were made by Messrs. Smeed, Dean, and Co., of Faversham, who are the largest individual manufacturers in the kingdom. It is remarkable what a quantity of bricks can be made in a season. To make a million is regarded as being excellent work, but there are several instances in the district to which it is made at 1,200,000 or 1,300,000 were made at one time.

IMPORTANT FIND OF IRON ORE.—A Barrow-in-Furness correspondent writes:—"Explorers in this neighbourhood have been successful in the find of a large pocket of metal at a place called Scale, where hitherto the existence of hematite was not known. This is an important event to the district, inasmuch as the ore here demonstrates its existence over a larger area than has previously been known; and while it affords another proof of the inexhaustible bed of metal in the Furness district, it gives confidence to manufacturers to increase their plant and extend their facilities for the production of that class of iron from the highest class of steel can be produced. This is also of great

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and painful illness. Mr. FRANCIS TREVITHICK, son of  
and world-wide fame—Richard Trevithick—breathed his last at  
the end of last week, having now returned to work. They have been  
influenced to do this by the expressed determination of the masters to  
shut down the pits if a dispute of any magnitude occurred, and  
by the refusal of the Miners' National Union to afford them any  
help, "as the men in resolving to strike had acted in direct opposition  
to one of the rules of the Union, which was that where arbitration  
was available a strike should not be resorted to." With the  
exception of some four or five collieries, employing about 1500 or  
1000 men, the pits generally in the district are in full operation.  
The coal market is more settled than it was a week ago, and so, too,  
is the iron market, but without any improved demand.

ULEXITE AND FRANKLANDITE.—The latter name has been given  
to Prof. J. E. REYNOLDS to a new mineral borate found with ulexite  
at Tarapaca, Peru, but in describing it has adopted the wrong for-  
mula for ulexite, and thus given an erroneous notion as to the  
relation which the two minerals bear to each other. The formula  
originally proposed by Prof. How (but afterwards erroneously at-  
tributed to Knut) is acknowledged as correct for ulexite, whilst  
Lang's has shown Rammelberg's, adopted by Reynolds, to be incor-  
rect. The result is that the difference between ulexite and frank-  
landite is not as Prof. Reynolds gives it—"that the substitution of  
one molecule of sodium oxide for three molecules of water is capable  
of converting ulexite into franklandite as far as composition is con-  
cerned"; but that the latter differs from the former in containing  
one molecule of sodium-metaborate in addition.

PROPOSED RAILWAY THROUGH THE MINING DISTRICTS OF  
MOUNT DEVON.—A correspondent informs us that he has seen a  
plan prepared by Mr. Risdon, C.E., of a projected line from Barn-  
staple to Combmarin, so as to pass near the silver-lead mines now  
being worked in that locality. The line would form a junction with the  
Great Western and London and South-Western lines, about half  
a mile from Barnstaple, then pass round to the north-east of their  
heads, and so on to Combmarin. The plan is to be submitted to the offi-  
cials of these two trunk lines, in the hope of having their support.

## REPORT FROM CORNWALL.

Nov. 1.—Nothing can be more encouraging than the present aspect  
of mining prospects. Although the official figures for the tin  
standard remain unchanged prices may fairly be put at 2s. above the tin  
standard, so that the actual rise has been 7s. a ton, and not 5s.  
This is a great deal better than waiting year after year for the new  
war to bring the more prosperous times with which, somehow, we  
have never been favoured by a new year yet. Prices of shares,  
not only keep up, but in many instances continue to advance, and  
with very good cause. If only the general business of the  
country would improve a little more rapidly we should see some-  
thing like the old times back again. Happily, there seems some  
reasonable hope that the war, which, contrary to a very general ex-  
pectation, has done mining no good, will not be long protracted.  
The loss caused by the depression has been forcibly indicated  
by a calculation made concerning Tincroft and Carn Brea. Carn  
Brea, the tin sold in 1876 at the 1872 prices would have realised  
more than double the money—76,500/- instead of 37,243/- The differ-  
ence at Tincroft would have been 37,000/-, or in the two together  
30,000/-, which sum was entirely lost to the adventurers. Very  
dividends it would have made. As to the market value  
of the mines, it declined in more than equal proportion when we  
regard their essential value as mining property, and look beyond  
the mere prospects of the moment—a thing which a good many ad-  
venturers seem utterly unable to do. Carn Brea fell from 155/- to  
115/-; Tincroft from 60/- to 9/- 10s., a drop from 515,000/- to 78,000/-  
and these two mines afford a very fair indication of what the course  
events has been throughout the country.

Carn Brea is bearing its testimony to the value and efficiency  
of the boring machine at work in the 205 fathoms level, where it is  
going at the rate of 6 to 7 fms. a month. This part of the mine  
is now developed in a quarter of the time that would otherwise  
have been possible, and one need not repeat how in mining,  
as in all other industries, time is money. A dozen  
years hence, when mechanical boring will be the rule all over Corn-  
wall, people will wonder how its introduction could have been so  
delayed.

Cornwall has again distinguished itself in the competition for the  
prize offered by the Turners' Company of London for turning in  
gold and marble. This year the first prize in this competition has  
been carried off by Mr. John Nankervis, of Ruan Minor, Helston.

His work was a tazza, in the red serpentine of the Lizard, the hand-  
work of England's ornamental stones, the design enriched by dol-  
lars. The honours are substantial—a large silver medal, the free-  
dom of the company, and the freedom of the City of London. The  
County can hold its own. Only the other day, too, Mr. S. Trevail,  
of Twardreath, who has erected most of the School Board  
of Cornwall, was successful in a competition at Plymouth—  
"Cornish London"—against competitors from all parts of  
the kingdom.

Mr. H. Collins, F.G.S., is delivering a course of lectures on Geo-  
logy, which is likely to do good service in popularising and  
teaching the general principles of this important science. It will  
be for want of teaching if the future generations of Cornish  
men are not wiser than the old ones. What has been lost to  
young men by scientific ignorance was well illustrated by some  
recent remarks of the Rev. Sulten Rogers, president of the Miners'  
Association. He said that Mr. Charles Fox had some years since  
noted a very striking fact—that from a certain Cornish mine  
had been sold for years large quantities of muriate at a very  
low price, which was subsequently discovered to be richer in tin  
than the average of Dolcoath ore. He had mentioned this fact to a  
new deal, who informed him that his firm had obtained an  
import of 20,000c. in buying the argentiferous copper ores from  
this same mine, which was never discovered by the sellers. This  
was discovered by means of the blowpipe. There were  
many students of the Mineralogical Society who were com-  
pelled to make such a discovery, and he would strongly recommend  
to make this instrument a special study. He would also draw  
attention to the fact that whereas some 20 years ago the number of  
miners who knew more than about a dozen of the commonest  
minerals might have been counted on one's fingers, there  
are now scores of good practical mineralogists, nearly every one of  
whom has been trained in the classes of the association.

On the same occasion happily illustrated the advantages of  
mining training. He had travelled much in many mining countries;  
had been brought into contact with Cornish miners, some of  
whom had studied in the Miners' Association classes, as well as  
of all nationalities. He had found that if there was a  
good hard work to do, the best man to do it was a Cornish  
miner; if anything required special intelligence, the student  
was sure to be called upon. Times were  
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and painful illness. Mr. FRANCIS TREVITHICK, son of  
and world-wide fame—Richard Trevithick—breathed his last at  
the end of last week, having now returned to work. They have been  
influenced to do this by the expressed determination of the masters to  
shut down the pits if a dispute of any magnitude occurred, and  
by the refusal of the Miners' National Union to afford them any  
help, "as the men in resolving to strike had acted in direct opposition  
to one of the rules of the Union, which was that where arbitration  
was available a strike should not be resorted to." With the  
exception of some four or five collieries, employing about 1500 or  
1000 men, the pits generally in the district are in full operation.  
The coal market is more settled than it was a week ago, and so, too,  
is the iron market, but without any improved demand.

The coroner's enquiry in reference to the boiler explosion in the  
Ravendale Ironworks, Tunstall, in June last, by which 11 lives were  
lost, has, after numerous adjournments, been completed. Mr.  
Staveley Hill, M.P., attended the enquiry on behalf of the Home  
Office, and Mr. Bramwell, C.E., made an examination of the boiler-  
plates, also by order of Mr. Cross, whose vigilant attention to the  
case has given great satisfaction in the district. The plates were  
subjected to severe tests, under the direction of Mr. Bramwell, who  
gave a minute description of the experiments and their results.

Two of the plates were brittle, and Mr. Bramwell was of opinion  
that boilers before being used should be tested by hydraulic pres-  
sure, and after the insertion of new plates, should undergo the same  
test. Toughness was a more important quality in boiler iron than  
tensile strength, and the ordinary mode of testing of the latter was  
defective. Power of flexibility ought to be considered more than  
tensile strain. Tensile strain was an imperfect test. Mr. Bram-  
well said boilers surrounded by external heat ought never to be  
worked at a higher pressure than one-sixth of the bursting strain,  
and this boiler had been worked at one-fourth. He attributed the  
explosion to the brittleness of a portion of the iron. The jury found  
a verdict of "Accidental Death," accompanied by a recommenda-  
tion that no new boiler should be used before being tested by hydraulic  
pressure, and that the same test be applied to every boiler after being  
repaired, that no boiler be worked at a greater pressure than one-  
sixth of its bursting strain, and that all boilers be under efficient  
control and be inspected at every change and turn.

A difficulty has arisen which threatens to end in the closing of  
the ironworks of the Osier Bed Company (Messrs. W. M. Sparrow  
and Co.), of this town. A few days ago the men engaged in the  
tinning shops made a demand for an increase of wages on account  
of some alteration in the making of the plates. This was refused,  
as the employers have already lost a large sum in keeping the works  
in operation. Some of the men declined to work, and they were  
paid off. The mills and forges are now idle, though work is going  
on in a few of the shops to complete the work in hand. Whether  
the works will be closed altogether or not is not yet settled.

The actions against the Birmingham Canal Company, which were  
brought by Messrs. George and R. Thomas, colliery owners, Blox-  
wich, and by Messrs. S. Groucott and Sons, for damages resulting  
from the overflow of a brook used for carrying off the surplus water  
of the canal in 1875 has attracted much attention. The case was a  
long one, much professional evidence being adduced. Mr. Dowdes-  
well, Q.C., who heard the case of Messrs. Thomas (the other not  
being gone into yet) will hear the final arguments of the counsel  
next Saturday, in London, and shortly afterwards we may learn his  
decision. Messrs. Groucott's case is adjourned *sine die*, and they  
will give defendants notice to proceed. Each firm claimed 3000/-  
as compensation for the flooding of their collieries. As the case is  
sub judice yet no comments can be made upon it, but, briefly, it may  
be stated that near the Beechdale Colliery, owned by Messrs. Thomas, the  
canal company discharge the surplus water from their canal into the Sneyd brook,  
and during the rainy period in October, 1875, they had turned so much water into  
the brook from this canal that it had overflowed its banks, and, running into the  
pits, quite overcame the pumping engines and stopped operations. The weir at  
this place had been increased, and much more water had been sent into the brook  
than it was calculated to carry it away. Therefore, the plaintiffs considered  
that the company had been guilty of negligence, and ought to pay for the damages caused  
from that negligence. The plea of the defendants is that they did all they could to  
prevent damage from the floods. Whether they did the referee will decide.  
The evidence on behalf of the plaintiff was very complete and voluminous.

—*Wolverhampton Chronicle.*

## REPORT FROM DERBYSHIRE AND YORKSHIRE.

Nov. 1.—Very little change has taken place in the state of the  
Iron and Coal Trades of the district of late. There has been the  
usual output of pig, with a steady but by no means active demand  
either for local requirements or exportation to other districts. In  
manufactured iron business is fairly maintained at the leading  
establishments. House coal moves off more freely, and a large  
tonnage is being sent to the Metropolis, so that some of the pits at  
Clay Cross and other places are busier than they have been for some  
time. Matters are now looking more promising at Dronfield and  
Unstone. After being out on strike for about nine months the men  
at Messrs. Addy and Sons' colliery at the former place have agreed  
to resume work, a settlement having been come to on Wednesday.  
This will be the means of finding employment for about 200 men  
and boys, and at the same time be a relief to the Miners' Association,  
to which most of the men belonged, and who were consequently  
in receipt of the usual strike pay. This resumption of  
work does not speak much in favour of Mr. Macdonald's proposed  
scheme of limiting the output of coal, so as to advance wages. One  
would think that the most effectual means for restricting production  
would be by setting down a number of collieries altogether  
instead of reducing the number of working hours. In Derbyshire,  
however, there is not much likelihood of Mr. Macdonald's panacea  
being attempted.

Most of the Sheffield branches of trade are still very quiet, and  
there does not appear much chance of their improving during the  
remainder of the year. Makers of Bessemer rails are of course  
doing very well, and the orders in hand will last some time at  
several of the works. In cast-steel, business is still but moderate,  
little being done in rifle-barrels, general ordnance, or lighter and  
ordinary material. Some of the wireworkers were doing very well,  
considering the state of affairs generally in the town. The sheet  
and plate mills are only running moderately well, and there does  
not appear to be much doing in ordinary rails. Rather more is  
being done in some descriptions of goods for Australia, although it  
is said that American houses have taken from us a great deal of  
the trade with that important colony. Such may be the case with  
respect to inferior qualities of tools, but our manufacturers still  
hold their own for cutlery and other steel goods, for which there is  
a rather better demand even for America itself. Fancy goods and  
plated ware are meeting with a better enquiry, as is generally the  
case when Christmas approaches. Malleable material goes off tolerably  
well, and is now used for many purposes for which steel and  
copper were formerly considered to be the necessary metal. At the  
works of Messrs. Crowley and Co. there is the greatest variety to be  
seen of any known establishment, some of the castings being finely  
finished to equal the most elaborate workings in steel. At the works  
outside the town business is by no means brisk, excepting those  
engaged in the production of Bessemer. The Northfield Works are  
entirely closed, so that a good many men have been thrown out of  
employment, and at a time when work is hard to be obtained. In  
South Yorkshire the house coal trade has improved, but it may  
also be said that production is rapidly increasing in all directions,  
so that coal of every description is plentiful, whilst it is not unlikely  
that before long we shall see a good deal of steam coal stacked  
on the pit hills.

The directors of Messrs. Wells, Birch, Ryde, and Co. (Limited)  
have celebrated the opening of a branch railway in connection with  
their Hoyland Silkstone Colliery, near Barnsley. The line is only  
a mile in length, but it opens out a district through which none has  
previously passed, and it will be of great local service. Its cost  
is about 20,000/. There was present at the opening a numerous company, including  
several of the directors and officials of the Manchester, Sheffield, and Lincolnshire  
Company—Sir Edward Watkin, M.P. (chairman), Mr. W. Fenton (deputy  
chairman), Colonel Hutton, Mr. Alfred M. Watkin, M.P., and Mr. J. W. Massey  
(directors); Mr. R. G. Underdown, general manager; Mr. E. Ross, secretary;  
Mr. C. Sacré, engineer; Mr. Bradley, general superintendent; and Mr. Lingard,  
solicitor to the company. They were received at the colliery by Mr. C. Wells,  
the chairman of the company, and Mr. J. Higson (J. and P. Higson, Manchester),  
the company's engineer. Sir Edward Watkin, with others, went down the  
fine shaft, which is 20 ft. in diameter, and went into the workings and examined  
them. Whilst at the bottom Sir Edward remarked that he had about achieved  
the ambition of his early days, which was to go up in a balloon, go down a colliery,  
and be a Member of Parliament. Subsequently the company were entertained  
at dinner at the King's Head Hotel, Barnsley. Mr. C. Wells presided.  
The chairman, in proposing Success to the Manchester, Sheffield, and Lincolnshire  
Company, referred to the rumour of an amalgamation with two other nail-  
ing companies, and expressed a hope that this would long remain an inde-  
pendent company. As an indication of the progress which the company had made,  
he said that when Sir Edward Watkin took the helm the shares stood at 19/- and  
2/- each, whereas now they were over 50/. In replying to the toast, Sir Edward  
Watkin congratulated Messrs. Wells and Company, and called attention to the remarkable  
developments of the colliery industry in the Barnsley district of late  
years, but upon the question of amalgamation he refrained from speaking.

On Thursday the Barnsley seam of coal was reached at the Monck-  
ton Main Colliery, about six miles from Barnsley, at a depth of  
rather more than 400 yards. Instead of 8 ft. or 9 ft., however, it  
was found to be only 5 ft. 6 in. thick, but about 7 ft. above it there  
was 4 ft. more coal, so that it would appear that the two are really  
only one seam, the parting of dirt between them being such as is  
likely to be met with as the coal is met with along the northern part  
of the district.

At the Hoyland Silkstone Colliery the men are still on strike,  
and at a meeting of the Council of the Miners' Association, held at  
Barnsley, on Monday, it was determined that the men should re-

ceive strike pay, which had been stopped for several weeks on the men refusing to resume work on the terms agreed upon by the manager and a deputation from the Association.

#### TRADE OF THE TYNE AND WEAR.

Oct. 31.—There is little change to notice in the general position of the Coal Trade here. Shipments of gas and house coals have been very large on the Tyne and Wear during the week, and though prices are firmer no material advance can be noticed. There is little change in Northumberland in the state of trade at the steam coal works, only a few of which are making full time; the great majority are working little more than half-time, and, of course, numbers of the men are in difficulties; those at work, however, contribute towards the support of those not so fortunate. The North Seaton Colliery is not expected to be commenced again this winter. At East Hyllywell a number of men have been dispensed with; one of the pits at Delaval will be stopped during the present week. At the great Dudley Works only five days have been worked during the past fortnight. One of the pits at Cramlington is to be stopped. As so many works have been stopped it is expected that those retained at work will be better employed shortly. The Cowpen Coal Company are boring for coal at Woodhorn, where it is intended if the seams should prove of good quality to sink shafts in such a position as to get a large tract of coal without much expense for underground haulage. This shows that there is still some confidence that the trade will in time recover from its present depression, and also that the masters are determined to work the coal at the lowest possible cost. The men in the steam coal collieries have not yet agreed to increase the hours of work, but that question is not finally settled, and they are now expected to make some concession on this point.

In Durham the works, although not fully employed, are certainly in a better position than in Northumberland. The gas-coal works are best employed, and have some chance of making a little profit, and the best house and coke works are in a similar position, but for all inferior coals the demand continues quite inadequate, and the prices realised are far from remunerative.

At the North of England Institute of Mining and Mechanical Engineers meeting on Saturday a paper will be read "On the condition of mining industry in Germany in the year 1875," by Mr. J. B. Simpson, and the following paper will be open for discussion "On an improved method of detecting small quantities of inflammable gas," by Mr. A. L. Stevenson.

Preliminary trials of a new form of railway coupling, which is the patented invention of Mr. Richard Harrison, C.E., of Union Chambers, Grainger-street, West, were carried out on portions of the railway laid through Messrs. John Spencer and Sons, Newburn-street Works, on Friday. By means of this coupling porters are able to couple or uncouple the wagons of a goods train without having to pass between them. The operation is very simple, and requires no skill on the part of the attendant. As two trucks are pushed together the act of turning a small handle on either side of the wagon serves to couple them together. Similarly, when it is desired to disconnect or uncouple any portion of a train the same motion is given to the handle as for coupling. In the common chain coupling, as at present used, every time a truck has to be connected to or disconnected from another a servant is required to go between the wagons, and lift the end link of the coupling chain on to or off the opposite hook. It frequently happens that the train is moving during the whole operation, and the porter has to stop below the buffers to come from between the wagons. Even when the train is at rest the signal "all right" is given, and the train started before the man is clear of the wheels. Should he slip or stumble he is almost certain to be seriously injured, and may lose his life. All this is bad enough when the work is carried on in daylight, but when it is considered that on most of our crowded passenger lines the bulk of the heavy goods traffic is worked at night some idea may be formed of the serious loss of life and limb involved in the present method of coupling railway trucks, and of the urgent necessity of some contrivance to render the work less dangerous.

From a recent Board of Trade Report it appears that in one year 122 railway servants were killed and 461 injured in joining, leaving, or falling off engines or vehicles, whilst 51 were killed and 347 injured in coupling and uncoupling rolling stock. In the Harrison improved coupling, which was put in operation on Friday, a long iron rod or shaft is hung across the truck in bearings just below the end of the wagon framing. On each end of the shaft is a short handle, by which the bar may be turned through a quarter of a circle. Near the centre of the rod are two light curved arms, one on each side of the drawhook. When the shaft is rotated the curved arms act on two pieces projecting at right angles from each side of the coupling link, and raise it sufficiently to pass over the hook of the approaching wagon. When the trucks are close enough the attendant lets the handle go, the link falls on to the opposite hook, and the curved arms return to their original position under the wagon. Harrison's coupling link is somewhat different to the ordinary chain. The end link is U-shaped, having the two pieces mentioned above projecting outwards at right angles from the straight portions of the U, a few inches from the open end. Two cheeks of flat plates, about 9 in. long, are attached by means of a bolt to the open end of the U-link, one on each side, their other ends being connected with the drawhook by means of the bolt which had served to attach the ordinary coupling chain. It will be readily seen that with this construction of coupling link the same amount of play may be given between the wagons as with the ordinary coupling chains, thus rendering a train up with the new coupling as easy to start as one of the old chains. The great advantages of Mr. Harrison's invention are that either coupling or uncoupling may be accomplished by means of a handle on each side of the wagon without a man going in between. No portion of the apparatus projects beyond the sides of the wagon. It is extremely simple, and consequently inexpensive. It has no springs or catches, and requires no oil. It will act equally well on the sharpest curves and steepest inclines as on a straight level road. One of its greatest advantages from a mechanical point of view is that the lifting mechanism is completely detached from the link, so that when a wagon is running the link alone is in strain, the shaft and arms being called into play only when it is desired to raise the link for coupling or uncoupling. This ensures the minimum of wear and tear, and consequently of cost for repairs.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Nov. 1.—The Iron Trade has exhibited but little indications of improvement, and another step in the wrong direction is the stopping of the Briton Ferry Works, which goes to swell the list of works which have succumbed to the depression of trade and the unremunerative nature of prices. However, there are more orders for iron rails in hand than usual on account of India and the colonies, and this circumstance is more peculiar in consequence of the strong prejudice which exists in favour of steel. Clearances during the week have been small, but include parcels to Gothenburg, &c. There is a probability of a revival of trade in the direction of America, though, perhaps, not to the extent which has previously been the case, but at any rate there is an enquiry in this direction. The steelworks are as usual fairly well employed. The bar trade is unaltered, and in this respect the Belgians continue to be our rivals, and to an unsatisfactory extent too. Tin-plates are materially unaltered, and there is no chance of an improvement until the beginning of next year.

The Coal Trade is not materially altered. As to the foreign demand, there is no improvement, and the heavy amount of rain which has fallen lately has caused several works in the neighbourhood of Cardiff to be flooded, though no serious mischief has been done. There is a fair demand for house qualities, but steam coals are stationary. Coke is a little better enquired for. Patent fuel is dull. As to the work which is given at the various collieries, it differs very materially; at some the pits are stopped at intervals, while at others only one, two, or three days are placed at the service of the men. Of course, in other instances the pits are fully employed.

As an instance of local enterprise I may mention that the Great

Western Railway Company are about sinking two new shafts on their property at Mae-teg. The work has been entrusted to Mr. W. Kendrick, of Dowlais and Westminster.

As to the Cwmavon Ironworks, which, as stated in last week's Journal, were purchased by Mr. W. Shaw and others for 55,000*l.*, the tin-plate works and their stocks have been sold for 51,000*l.*, being nearly the whole of the cost price, and it is evident from other sales that the purchasers have made a good thing out of it. We understand that a committee of dissentient shareholders is being formed, who will take all matters connected with the sale of the property into consideration.

At a delegate meeting, held this week, it was resolved to send a deputation to the Nant-y-Glo and Blaina Company's manager with reference to the 5 per cent. reduction. With regard to a further reduction at Risca, the meeting resolved to support the men in their resistance to a reduction. The men have recently consented to a 5 per cent. reduction, and are threatened with a further 20 per cent. At the Tredegar Police Court the Blaina and Nant-y-Glo Company were charged with infringing the Mines Regulation Act by neglecting to keep plans of the Hirwain and Gethin Pits, at Blaina. Mr. Cadman, Government Inspector, laid the information in each case, and Mr. Plews conducted the prosecution. The neglect was admitted, and the surveyor to the company (Mr. Evans) said a plan was being made of all the works above and underground. The Bench inflicted a fine of 5*l.* and costs in each case, and allowed the usual solicitors' fees. Informations were also laid against Messrs. Matthews and Evans, colliery owners, Maesycwmm, for infringing Rules 3, 13, and 29 of the Mines Regulation Act. The defendants pleaded guilty. The neglect was in not providing books containing a daily record of the state of the workings, and also with omitting to place a proper fence round an air-shaft. There were three separate offences, and the Bench imposed a penalty of 40*l.* and costs in every case.

The cutting of the first sod for the Neath Harbour works was performed on Thursday as announced. The project, briefly explained, is to float the Neath river from near Neath Abbey to Cwrt Sark Pill, involving an estimated expenditure of 165,000*l.*, and the success achieved is in a great measure due to the exertions of Mr. James Kemphorne, the ex-Mayor of Neath. Lady Dynevor had a very enthusiastic reception, the Mayor, corporation, and townpeople, who are enthusiastically favourable to the project, harbour commissioners, local artillery and rifles, Neath pilots, and others going in procession to Glyn Llechwedd, where the ceremony took place. Prayers having been read by Archdeacon Griffiths, Mr. J. H. Rowlands presented her ladyship with a very neat address duly signed on behalf of those presenting it, by himself, and Mr. Kemphorne. Lady Dynevor having graciously accepted the document, inaugurated the work by turning the first sod, other sods being afterwards cut by Mrs. Gwyn, Mrs. Rowlands, and others. The silver spade with which the work was done was supplied by Mr. Davies, jeweller, and inscribed:—"Neath Harbour. Presented to Lady Dynevor upon the occasion of her ladyship turning the first sod of the Neath Docks and Works, Oct. 25th, 1877." Mr. Ball furnished the oaken wheelbarrow. At the luncheon after the ceremony about 250 guests sat down, amongst them being Archdeacon Griffiths, Miss Griffiths, Llrd and Lady Dynevor, Mr. H. M. Miers, Mrs. Miers, Mr. E. Moore, Mr. A. Miers, Miss Griffiths, Rev. Gethin Griffith, Mr. J. N. and Mrs. Moore, Lieutenant Tricky Swanson; Mr. J. Thomas, Court Herbert; Mr. E. S. and Mrs. Parsons; Mr. D. Thomas, Pencaitl; Dr. Mrs., and Miss Ryding, Mr. W. M. Jeffreys, Mr. H. St. G. Caulfield, Mr. R. Thomas, Mayor of Neath; Mr. J. and Mrs. K. Kemphorne, Rev. J. P. Hughes, Rev. and Mrs. Buckley, Dr. and Mrs. Griffiths, Mr. W. and Mrs. Whittington, Mr. W. Ritson, Mr. B. P. Biddulph, Mr. A. Hayman, Mr. Humby, Mr. R. Smith, South Wales Railway; Mr. G. March, West of England Bank; Mr. W. Whittington, borough surveyor; Mr. T. P. Whittington, Mr. Russell, Mr. D. Davies, Mr. R. Williams, and the Rev. L. Jones, of Cadoxton. Archdeacon Griffiths, in responding to the toast "The Bishop and Clergy of the Diocese and Ministers of all Denominations," paid a high tribute to the ministers of other denominations, with whom he and those with him had, he said, always worked with the utmost cordiality. "The Health of Lady Dynevor" was responded to by Lord Dynevor, in doing which he said that the mining districts of this country had suffered greatly. In a conversation which he had with Sir George Elliot, that gentleman stated that there was an excellent opening in Neath for carrying out the works which they had commenced that day. There were many disappointments in bringing about works of that description, but he congratulated the harbour commissioners, and also the town, on the success which had been obtained, and hoped it promised, brighter days.

The toasts of the Commissioners of Neath Harbour and the Mayor and Corporation of Neath were afterwards duly honoured, and Mr. Gwyn, in proposing "The Chairman" (Mr. J. H. Rowlands), said he had always found him ready to do his utmost for the advantage of the county. He had shown great experience and ability in whatever he took in hand. As to the present undertaking, he must also in justice refer to the efforts of his worthy friends Mr. Kemphorne and Mr. John Moore. He hoped they would not only live to see the docks finished and filled with ships, but that they would live to see what they had done carried to the successful issue which when most sanguine they anticipated. The Chairman, who was warmly received, acknowledged the compliment. He firmly believed that they would be able to carry the undertaking through. It was true that it was three years since they obtained their Act, and considerable exertions had been necessary. The result was mostly due, however, to Mr. Kemphorne and the valuable aid they had received from Mr. John Moore. He hoped that in three years hence they would have the Princess of Wales at Neath to move the lever which would open the docks. Mr. David Bevan, in a very complimentary manner, proposed the healths of the solicitor (Mr. Kemphorne) and the engineer (Mr. Brereton). Mr. Brereton hoped that his opinions in regard to the dock would be justified in three years hence by the result. Mr. Kemphorne, who was received with great cheering, stated that some time back the Commissioners came to the conclusion that they should do something to improve their harbour, as other towns have done, and he, for one, would not be satisfied until the port of Neath became one of the best in the channel, and a second Liverpool. The place was admirably suited for docks, and was the natural outlet of a large mineral district. The healths of the contractors—Messrs. A. Vignoles and Greenbank—were proposed by Mr. Bidder, and Mr. Greenbank responded.

Mr. Sutton, in proposing "Prosperity to the Mining and Manufacturing Interests of the District," stated that the introduction of science in the manufacture of steel pointed to a degree of prosperity in that neighbourhood. It was necessary that steel should be made from foreign ores, and those of our own country were of an inferior description, and were more costly. Foreign ores could be obtained in unlimited quantities with a four days' voyage, and he was glad to say that Neath was nearer to the ports from which ores were sent than almost any other port in the channel. The coal in the Neath district were also more suited than any other for the manufacture of steel, and they could not look round without seeing that Neath would become one of the greatest steel manufacturers in South Wales. Mr. J. N. Moore responded, and proposed the "Railway and Canal Interests," which was responded to by Mr. Bessant and Mr. Caulfield. The speakers to the following toasts included Mr. P. Charles, Mr. Jeffreys, Mr. Humby, who in the course of his speech mentioned that the Neath Copper Works, which it will be remembered were formerly known as the Crown, would shortly again be opened, and from the enlarged facilities for commerce which the harbour will offer, a general impetus will, no doubt, be given to the entire trade of the district.

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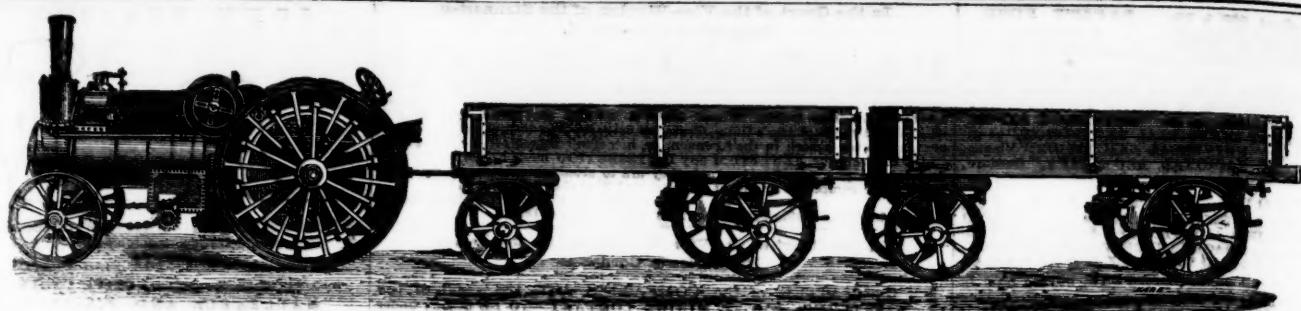
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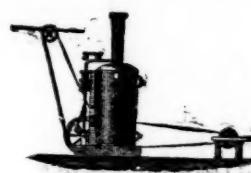
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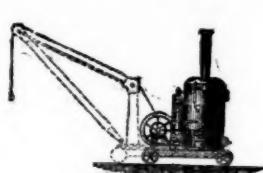
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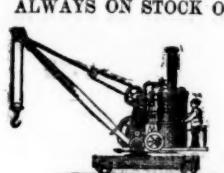
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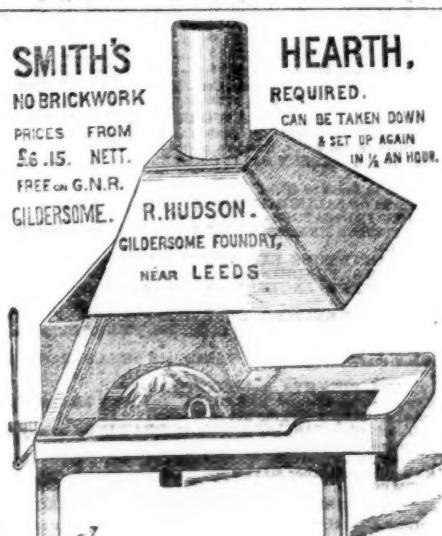
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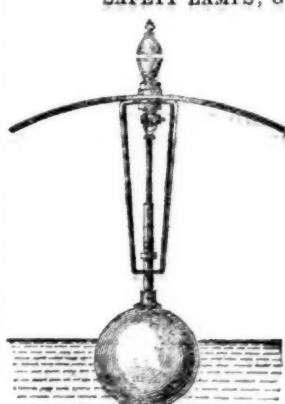
EXPLOSIONS FROM STEAM BOILERS have become so frequent, and are often attended with such serious results both to life and property, that any improvement tending to secure their safe cannot fail to be appreciated. From numerous examinations, made after explosions, by practical engineers, the great majority of accidents that occur are considered the result of a deficiency of water in the boilers. Experience has proved that it is good policy to furnish each boiler with this Self-acting Alarm, so constructed that, upon the water getting below a certain level, nothing can prevent the opening for the steam to act directly upon the instrument and cause the alarm.

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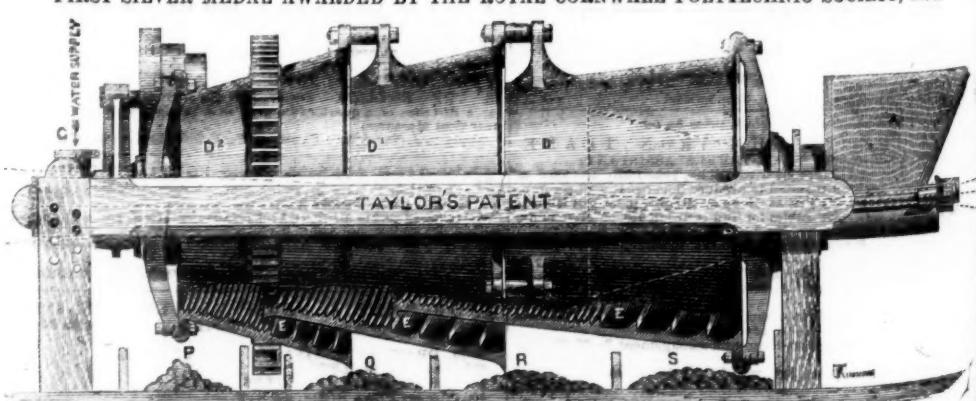
A loose pin at the top of the whistle enables anyone to test the alarm at a moment's notice. Practical men consider this the best Alarm hitherto offered.

The Engraving shows the mode of fixing to boiler, also the water level. In ordering, the diameter of the boiler should be given, and also the diameter of the flue when there is one, also distance from top of flue to top of boiler, or send sketch.

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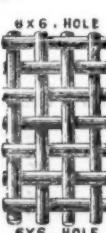
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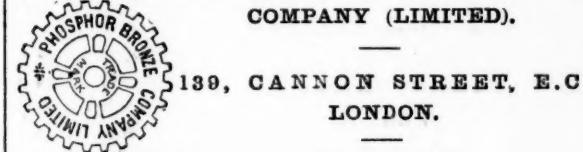
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30000 Bampfylde, c, t, m.s., Devon	1 0 0	—	—	—	0 2 0	0 2 0	June 1875
40000 Brookwood, c, Buckfastleigh	1 16 0	1	—	—	3 15 0	0 2 0	Nov. 1875
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34000 Cashwell, t, Cumberland	2 10 0	—	21 1/2	23 1/2	1 9 6	0 2 0	Aug. 1876
1000 Carn Brea, c, t, Illogan	7 6 5	42 1/2	48 50	308 0	1 0 0	1 0 0	Aug. 1876
24500 Cook's Kitchen, t, Illogan	23 17 3	21 1/2	21 1/2	—	11 17 0	0 5 0	July 1876
2040 Devon Gt. Consols, c, Tavistock	1 0 0	—	3	35 3	11 15 0	0 5 0	July 1876
4296 Doreoath, c, t, Camborne	10 14 10	38	38 40	—	11 16 8	0 5 0	Sept. 1877
8000 East Black Craig, t, Scotland	5 0 0	—	—	—	0 10 0	0 10 0	Feb. 1877
900 East Darren, t, Cardiganshire	32 0 0	—	—	—	235 10 0	1 0 0	Aug. 1876
6 00 East Pool, t, c, Illogan	9 9	9 1/2	9 1/2	—	15 2 3	0 2 0	June 1876
40 00 Glasgow Carr., c* [80,000 £1 p., 10,000 £5s. p.]	15 0	1 1/2	0 12 10	0 6 0	Mar. 1876	—	—
7500 Gorsedd and Merlyn Cons., t, Flint	2 10 0	64 1/2	54 1/2	0 5 0	0 5 0	0 5 0	Aug. 1876
10000 Great Laxey, t, Isle of Man	4 0 0	2	13 2	0 2 6	Apr. 1876	—	—
615 Gt. Retallack, t, bl., Perranzabuloe	5 18 6	—	—	0 1 6	0 1 6	May 1876	
25000 Gt. West Van., t, Cardigan, pref.	2 0 0	—	34 1/2	0 2 0	Oct. 1876	—	—
6400 Green Hurth, t, Durham	0 8 0	8	23 3	1 15 0	0 5 0	Aug. 1877	—
20000 Grogwinion, t, Cardigan	2 0 0	—	34 1/2	0 12 0	0 4 0	Feb. 1877	—
9880 Gunnislake (Clitter), t, c	5 8 0	23 1/2	23 1/2	0 12 9	0 1 0	Oct. 1876	—
1024 Herodsfoot, t, near Liskeard	8 10 0	6 1/2	62 5 0	0 10 0	Oct. 1872	—	—
18000 Hindton Down, c, Calstock	0 4 0	—	0 1 0	0 1 0	Nov. 1875	—	—
60000 Holmboe, a, c, s-i, Callington	1 0 0	2	0 3 6	0 6 0	July 1876	—	—
40000 Isle of Man, t, Isle of Man	26 0 0	—	82 5 0	0 10 0	Oct. 1876	—	—
10000 Leadhills, t, Lanarkshire	6 0 0	—	54 1/2	0 12 0	0 8 0	Oct. 1877	—
40000 Lisburne, t, Cardiganshire	18 18 0	70	65 70	583 10 0	1 0 0	July 1877	—
14000 Llandilo, t, bl., Montgomery	3 0 0	1/2	0 9 0	0 4 0	Nov. 1876	—	—
6120 Lovell, t, Wendron	18 0 0	—	2 2 2	0 17 6	0 6 0	Jan. 1874	—
2000 Marke Valley, c, Linkinhorne	5 3 6	—	7 15 0	0 2 0	Jan. 1876	—	—
60000 Miners Mining Co., Wrexham	5 0 0	18	67 8 2	0 3 0	Oct. 1877	—	—
20000 Mining Co. of Ireland, c, c, t	1 0 0	—	23 5 0	0 3 0	Jan. 1877	—	—
444 North Busy, c, Chacewater	3 9 6	5	1 10 9	0 1 0	July 1876	—	—
58 North Hendre, t, Wales	2 1 0	—	1 12 6	0 2 0	Aug. 1877	—	—
20000 Pean-an-drea Con., t, Redruth	0 8 6	—	0 9 0	0 0 0	June 1876	—	—
20000 Penhalls, t, St. Agnes	3 2 6	—	2 18 6	0 2 0	July 1876	—	—
60000 Pennant, t, bl., North Wales	8 0 0	—	5 5 2	0 5 0	Mar. 1876	—	—
45 950 Penzance, t, c, Gwennap	9 0 0	—	0 2 8 0	0 8 0	Nov. 1875	—	—
12000 Phoenix, t, W. Phoenix, t, Link	5 7 8	5 1/2	2 12 6	0 4 0	Nov. 1876	—	—
10000 Prince, t, bl., Holywell	1 0 0	—	0 14 0	0 1 0	Jan. 1876	—	—
20000 Red Rock, t, Cardigan	2 0 0	—	2 14 2	0 2 0	July 1876	—	—
20000 Roman Gravels, t, Salop	7 10 0	—	8 7 8	7 10 8	0 8 0	May 1876	—
512 South Cadran, c, St. Cleer	1 5 0	100	90 100	739 10 0	1 0 0	Oct. 1877	—
5123 South Condor, t, Camborne	6 8 6	9 1/2	2 18 0	0 6 0	Sept. 1877	—	—
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1 0000 So. Fr. Patrick, t, s-i, (8000 sh. issued)	1 0 0	—	0 7 0	0 1 0	Oct. 1876	—	—
1 0000 Tancerville, t, Saop	6 0 0	—	54 1/2	43 1/2	4 17 0	0 5 0	Dec. 1876
6000 Tincroft, t, Pool, Illogan	9 0 0	16	17 18	50 8 6	0 5 0	May 1877	—
15000 Van., t, Llandilo	4 5 0	34	32 34	22 3 6	0 12 0	Oct. 1877	—
3 000 W. Chiverton, t, Perranzabuloe	12 10 0	—	14 1/2	13 1/2	55 0 0	0 10 0	Jan. 1876
1783 West Poldice, St. Day	10 0 0	—	1 11 13	1 19 0	0 4 0	July 1876	—
512 West Tolgus, c, Redruth	95 10 0	75 1/2	69 71	23 15 0	1 10 0	Oct. 1876	—
2042 West Wheal Frances, t, Illogan	18 1 3	—	4 5 5	3 12 6	0 5 0	Oct. 1876	—
12000 West Wye Valley, t, Montgo	3 0 0	—	3 1/2	0 9 0	0 3 0	May 1877	—
1024 Wh. Eliza Consols, t, St. Austell	18 0 0	—	15 10 0	1 10 0	Oct. 1877	—	—
4925 Wh. Eliza Jane, t, Ken	2 18 10	—	1 15 1/2	8 5 0	0 5 0	July 1876	—
2500 Wh. Wheal kitty, t, St. Agnes	6 4 8	2 1/2	11 19 6	2 5 6	0 5 0	July 1874	—
2500 Wh. Newton, t, St. Agnes	1 0 0	—	0 4 0	0 0 0	June 1876	—	—
20000 Wh. Owles, t, St. Just	85 5 0	70	85 70	522 10 0	4 0 0	Aug. 1876	—
20000 Wh. Prussia, t, Redruth	2 0 0	—	4 1/2	52 9 0	0 2 8	Mar. 1872	—
25000 Wicklow, t, s-i, t, Wicklow	2 10 0	—	34 1/2	0 10 6	0 4 6	Oct. 1876	—
10000 Wye Valley, t, Montgomery	3 0 0	—	3 1/2	0 10 6	0 4 6	April 1877	—
3550 Alamillos, t, Spain	2 0 0	—	13 1/2	1 18 3	0 1 0	Oct. 1877	—
40000 Australian, c, South Australia	7 7 6	2	13 2	0 6 3	0 1 0	May 1877	—
10000 Battle Mountain, t, (6240 part pd.)	5 0 0	—	0 19 6	0 1 6	July 1876	—	—
15000 Birdseye Creek, g, California	4 0 0	—	0 10 0	0 10 0	Nov. 1876	—	—
123200 Burr, Burr, t, So. Australia	8 0 0	—	0 14 0	0 8 0	June 1876	—	—
20000 Cape Copper Mining, t, So. Africa	7 0 0	—	70 0	0 10 0	Oct. 1876	—	—
40000 Cedar Creek, g, California	5 0 0	—	0 10 0	0 2 0	Aug. 1876	—	—
35000 Coeane Sul. Co., Romagna, Italy	10 0 0	—	3 1/2	0 1 0	Aug. 1876	—	—
65000 Chicago, t, Utah	15 15 0	—	1 1 1/2	2 8 0	0 4 0	Aug. 1876	—
10000 Copiapo, t, Chile	5 0 0	2	13 2	0 13 6	0 4 0	Aug. 1876	—
100000 Don Pedro North del Rey	10 0 0	—	96 36	2 1/2	0 1 0	Oct. 1877	—
23500 Eberhardt & Aurora, t, Nevada	10 0 0	5	73 73	1 8 0	0 3 0	Dec. 1876	—
10000 English & Australian, t, S. Aust.	2 10 0	—	12 14	2 15 0	0 1 0	Mar. 1877	—
30000 Flagstaff, t, Utah	10 0 0	—	25 2	4 2	0 1 0	Mar. 1877	—
25000 Fortune, t, Spain	2 0 0	—	54 1/2	54 1/2	6 14 10	0 8 0	Aug. 1877
55000 Frontino & Bolivia, g, New Gran	2 0 0	—	8 3 1/2	0 1 0	June 1876	—	—
80000 Gold Run, hyd.	1 0 0	—	2 4 1/2	2 4 1/2	0 1 0	Oct. 1872	—
88000 Kapunda Mining Co. Australia	1 3 0	—	—	2 4 1/2	0 1 0	June 1873	—
20000 Last Chance, t, Utah	5 0 0	1	3 1/2	0 14 1/2	0 1 0	Oct. 1877	—
50000 Linare, t, Spain	3 0 0	63 1/2	63 1/2	0 14 1/2	17 3 10	0 6 0	Oct. 1877
50000 London and California, g*	3 0 0	—	34 1/2	0 1 0	Oct. 1877	—	—
7837 Lusitanian, Portugal	10 0 0	—	1 1 1/2	1 1 1/2	1 11 6	0 6 0	Oct. 1877
50000 Mammi Copperopolis of Utah, t, c	10 0 0	—	5 0 0	0 1 0	Mar. 1877	—	—
50000 Mountain Chief, t, Utah	10 0 0	—	23 28	26 28	23 1 1 11 1	1 1 1 1 1	Nov. 1877
100000 Port Phillip, t, Clunes?	1 0 0	56 1/2	56 1/2	1 9 0	0 1 0	Sept. 1877	—
50000 Richmon Consols, t, Nevada	5 0 0	7	8 8 1/2	3 9 0	0 7 8	Oct. 1876	—
40000 Santa Barbara, t, Brazil	10 0 0	10	1 1/2	3 9 0	0 7 8	Oct. 1876	—
100000 Scottish Australian Mining Co.	1 0 0	—	23 1/2	17 2/2	15 1/2	0 1 0	May 1877
80000 Scottish Austral. Mining Co., New	5 0 0	—	15 1/2	15 1/2	15 1/2	0 1 0	May 1877
125000 Sierra Buttes, g, California	2 0 0	—	34 1/2	34 1/2	15		